

NATIONAL CAR-BUILDER

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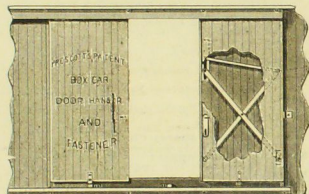
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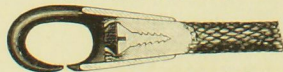
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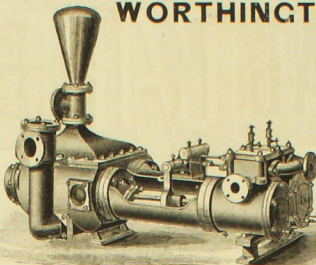


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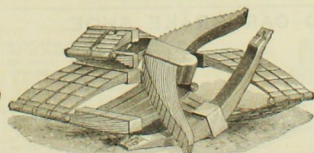
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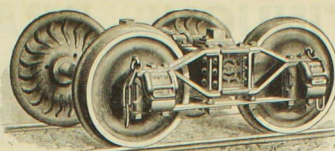
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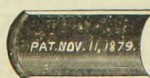
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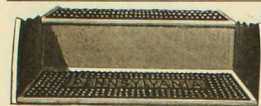
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N. E.—All work must be done from my standard patterns, which will be promptly and cheerfully furnished.—D. F. V. L.

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MANUFACTURERS OF PATENT STEEL BARB FENCING.

THE BEST AND CHEAPEST FENCE FOR RAILROADS.

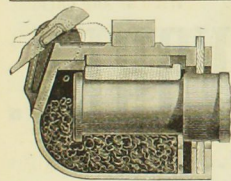


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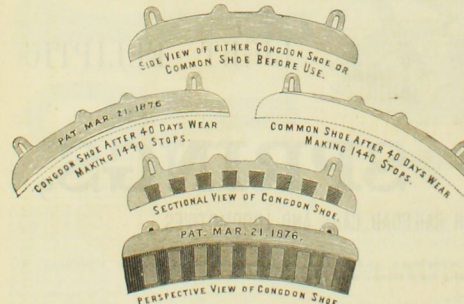
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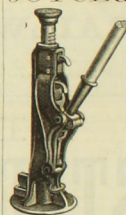
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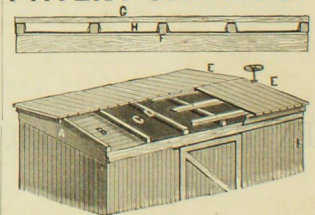


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Its capacity is 12 to 15 tons with two men. We make out one size, a two-inch round bar. Height, 29 inches.

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A Carline or Main Rafter. B Sub or under boarding. C Asphalt Felt, and when on Car painted with Imperishable Asphalt paint. D Felt Cap or Sub Rafter. E Upper board roof. F Sub Rafter. G Strippers on Sub Rafter. H Air Space between the Felt and upper board roof.

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A detailed illustration of a mechanical device, likely a pump or engine component, mounted on a sturdy wooden frame. The device features a central horizontal shaft with two large, spoked flywheels or gears. Various mechanical parts, including a piston rod and connecting mechanism, are visible. The entire assembly is supported by a four-legged wooden stand. The illustration is in a classic, engraved style.

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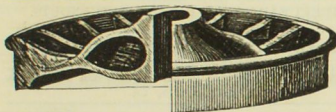
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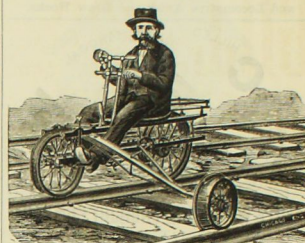
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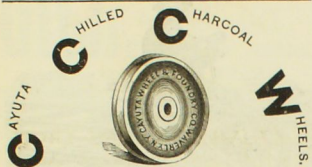
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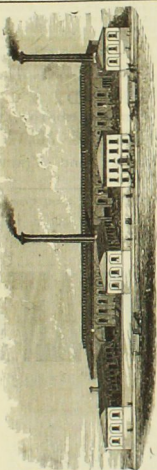


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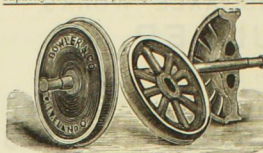
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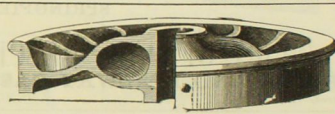
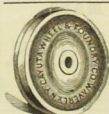
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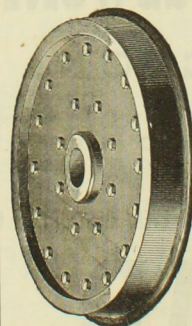


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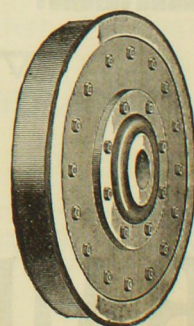
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Time, Repair, Car and
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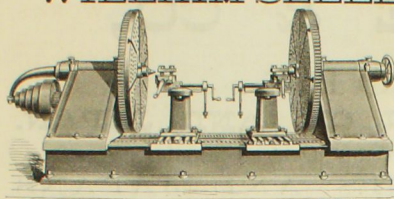
with a smaller Web-wheel
can be secured on Chicago

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THE NATIONAL CAR-BUILDER.

vii

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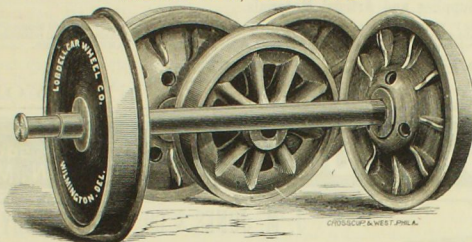


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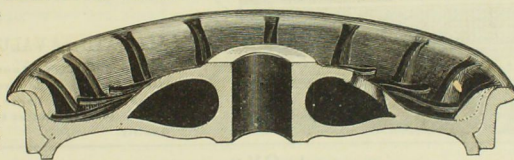
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THE TIRES.—The material composing
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ALTY, being a combination of metals, the
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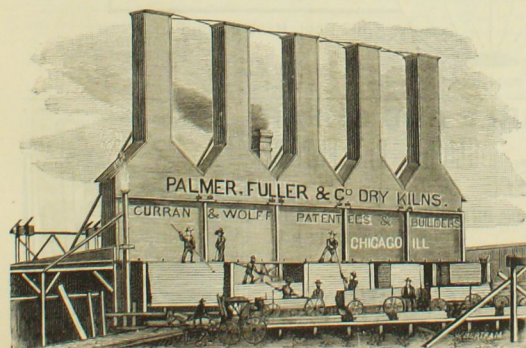
DURABILITY.—With these advantages
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EVERY 24 HOURS.

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LIBERTY SQUARE
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MANUFACTURERS OF

STREET RAILWAY CARS.

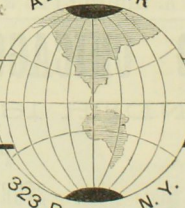
ESTABLISHED OVER 40 YEARS.

OUR CARS HAVE

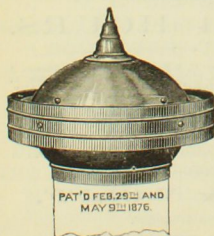
ALL LATE and VALUABLE IMPROVEMENTS,

Are noted for Light Running and Easy Riding, Combining Lightness and Strength with Beauty in Design and Finish. Our Large Facilities enable us to Fill Orders Quickly, and at the Lowest Prices for Superior quality.

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SIMPLE, DURABLE AND CHEAP.

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VENTILATORS,

For Ventilation of
Cars Depots, Round-Houses
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FOR

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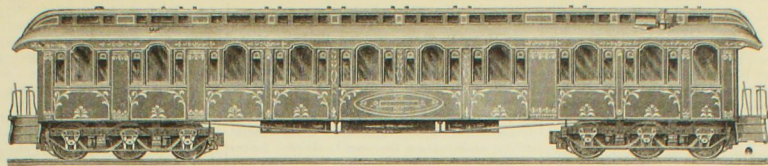
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THE NATIONAL CAR-BUILDER.



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VOLUME XII-1
NUMBER 3.

MARCH, 1881.

(SINGLE NUMBERS, TEN CENTS,
\$1.00 PER ANNUM.)

Miscellaneous Items.

The Huntingdon Car Works, at Huntingdon, Pa., are building 650 freight cars for the Texas & Pacific road.

The Lehigh Car and Manufacturing Company, at Stenton, Pa., are building 1,100 gondola cars for the Missouri Pacific.

The Louisville & Nashville shops, in Mobile, Ala., have lately built 40 new flat cars, besides doing the usual repair work.

The Central Vermont shops, at St. Albans, Vt., are turning out five new box cars a week. Those now built all have iron trucks.

The car shops of the Jacksonville, Pensacola & Mobile road at Tallahassee, Fla., were destroyed by fire on the 28th of January.

The Lehigh Car and Manufacturing Co., at Stenton, Pa., is turning out 16 gondolas a day, and has several large orders ahead for freight cars.

The repair shops of the Union Pacific are to be immediately enlarged to a considerable extent, so as to increase the capacity of building their own cars.

The Illinois Central is building six heavy Mogul engines at its Chicago shops. The Chicago & Northwestern is building six heavy passenger engines.

ARTICLES of incorporation have been filed in Ohio by the Lima Car Works. The shops are to be in Lima, Ohio, and the capital stock is fixed at \$100,000.

A WHITNEY & SONS, car wheel manufacturers, Philadelphia, are filling an order for a large number of car wheels and axles for the Mexican National Railway.

The work of rebuilding the shops of the Jacksonville, Pensacola & Mobile Railway Company, at Tallahassee, Fla., recently destroyed by fire, has been commenced.

The Lobdell Car Wheel Company, at Wilmington, Del., has recently bought a tract of 300 acres of land on the south side of the Christiana, for the purpose of extending its works.

The National Tube Works, of Boston, sold last year over 1,600 Mack Injectors, the greater portion of which were put upon locomotives belonging to the leading trunk lines of the country.

AN order for 144 locomotives has been given to the Baldwin Locomotive Works, of Philadelphia, by the Denver & Rio Grande Railroad, for the equipment of its extension. The total cost will be over a million.

The Mason Machine Works, Taunton, Mass., employ 800 men, and are full of work. This company always have a place for a first-class workman, even if they have to make it by discharging a poor one.

The Mowry Car Wheel Works, of Cincinnati, have sold their car-shops to the Cincinnati Street Railway Co., and will hereafter manufacture only

wheels and castings. They have orders for wheels sixty days ahead.

The Harrison Car Axle (independent wheel movement) has been adopted by the West Philadelphia Passenger Railway, and they have also been ordered upon six new cars of the Frankford & Southwark Street Railway of Philadelphia.

The Timms Automatic Transfer Car Co., of Indianapolis, Ind., have concluded negotiations for the location of their works at Columbus, Ohio. The erection of suitable buildings will soon be commenced, with a capacity of 15 freight cars per day.

FIFTY new six-ton dump cars are being constructed at the shops of the Norwich & Worcester Railroad in Norwich, for the New York & New England Railroad Company, and a sample ten-ton dump car is being made for experimental purposes.

The Barney & Smith Manufacturing Company, Dayton, Ohio, are to build 600 box, 400 stock, and 500 flat cars; also a lot of new sleepers and caboose cars, for the Northern Pacific. The color of the passenger cars will be yellow instead of brown, as heretofore.

PORTER & MEAKIN, of the Atlanta Machine Works in Atlanta, Ga., have recently extended their foundry and built a new erecting shop for cars. They have recently built 35 freight cars, and have rebuilt or repaired several sleeping and passenger cars.

The Wagner Palace Car Company is, it is understood, to give a thorough test to a newly patented car wheel, which is provided with a rubber belt between the wheel and the tire, and will, it is claimed, prevent the frequent breaks which occur in consequence of wheels striking the frogs.

The Long Island Railroad is to be greatly improved during the present year in road-bed and rolling-stock. Steel rails will be laid, a double-track will be extended along the south side, the depot buildings will be rendered more commodious, and more trains will be run than ever before.

A REWARD of \$250 has been offered by ten of the leading varnish manufacturers of the country, for the arrest and conviction of certain persons, or possibly one person with sundry aliases, who have fraudulently represented themselves as agents of several of these manufacturers, and as such have collected considerable sums of money.

The Harwood Chair Seat Company, of Boston, will supply the new union passenger depot at Greenfield, Mass., with their seats. Their specialty is the fiber seating, which closely resembles upholstery leather, and makes a very handsome and durable covering. They also furnished the seats for the Littleton station on the Fitchburg road.

MR. WM. H. VANDERBILT has recently ordered 105 new standard 8-wheel locomotives, with 5-foot drivers and 17 x 22 in. cylinders. Of these, 50 for the New York Central & Hudson River, and 30 for the Lake Shore, are to be built by the Schenectady Locomotive Works, and 25 for the Lake Shore by

the Grant Locomotive Works, at Paterson, N. J.

It has been judicially decided that a mail agent, when traveling as such on railroad trains, is not a passenger, and cannot therefore recover damages for injury in case of accident; also, that a passenger riding in a baggage car when there is room in the passenger cars, cannot recover in case of injury, if it shall appear that he would not have been injured if he had been in the passenger cars.

The passenger cars of the local trains of the Boston & Albany road, running between Boston and Worcester and intermediate points, have platform gates. The ones on the left hand side are shut and locked, to keep passengers from getting off on that side and being in the way of trains passing in the opposite direction. These gates have been in use nearly a year, and are an excellent precaution against accidents.

The Connotton Valley Railroad is now completed and in operation to a point 30 miles from Cleveland, and will be entirely finished by the middle of May. It has 10 locomotives, 15 passenger train cars, and 300 freight cars. Messrs. Penock Brothers, car-builders, at Minerva, Ohio, will build 1,000 additional cars for the road during the summer. The track is 3-foot gauge, and is laid with 40 lb. steel rails.

The Pennsylvania Railroad Company have recently made surveys of a new route, by means of which the famous horseshoe bend will in future cease to be used by passenger trains. The contemplated new line will be more nearly straight, but with steeper grades. With steel rails and heavy engines, it is thought that these grades will be less objectionable than the sharp and frequent curves of the present track.

The Taunton, Mass., Locomotive Works are very busy upon orders from several New England roads, the Cincinnati, Sandusky & Cleveland, and Union Pacific. Their largest orders are from the latter road, and include a number of 10-wheel engines. The works employ a force of 300 men, and have all they can do for the next four months. Among the orders that have been refused was one for 60 locomotives, and another for "one like the last, to be done in two weeks—money ready."

The car shops of the Fitchburg Railroad, at Fitchburg, Mass., employ 80 men, and turn out from 10 to 25 new freight cars a month, besides keeping up running repairs. During 1880, the shops built 51 box, 40 stock, 80 flat, 5 construction, 20 tip (Marden's patent) and 11 saloon cars—in all 210. In the locomotive shops, the Richardson sandblast is used for sharpening files. A bastard file can by this method be sharpened three or four times, and do good service after each sharpening.

At the Eastern Railroad car shops, Salem, Mass., Mr. J. D. Billings, master car-builder, has just completed 50 flat cars, 33 feet long, and with iron trucks, the last 22 of them having been built in 21 days. He has also built 2 baggage cars 50 feet long, with three doors on a side, which makes them very convenient in the

handling of baggage. The doors have Prescott's patent hangers. These cars are of uniform height with the passenger cars, and have clear-story roofs, and are also painted the same color. A Pullman sleeper has also been repaired and refitted with the latest Pullman improvements, including a new oak head-lining with painted ornamentation, furnished by the Pullman Company.

At the Allston shops of the Boston & Albany road, much time is saved by the following method of putting on the roofs of passenger cars: The floor of the car is set up on blocks 18 inches above the shop floor. Then on the sills are set a number of temporary posts and studs about 7 inches high, upon which the roof, frame and all, is built. With the roof in this position, the men do the principal part of the work easily from the shop floor, and with great dispatch, having their tools and material within easy reach. After the roof, including, of course, the clear-story, is completed and tinned, it is lifted to its proper elevation with tackles, and the permanent posts and studs put in. A roof can be built in this way in two-thirds the time required to do it on top of the car.

THE Westinghouse Air Brake Company are experimenting upon plans for substituting electric lights in locomotive head-lights in place of oil lamps. Should they prove successful it will be almost as great an invention as the air brakes. There is little difficulty in supplying electricity by machinery operated by the running of the locomotive itself, but the desideratum is to get up some machinery which will keep in operation when the locomotive stops, as otherwise the current of electricity will be broken and the light will go out. In order to do this it looks as if an engine will have to be built upon the locomotive, separate and distinct from the other machinery. The difficulties in the way will be overcome eventually, and the electric head-light become a fixed fact.

THE *Railroad Gazette* estimates that at the close of 1880 there were 93,637 miles of railroad in the United States, and that the population of the country was at the same time 50,880,000. The increase of population is very nearly 2½ per cent. a year, while the increase in railroad mileage last year was 8¼ per cent. At the beginning of 1880 there were 573 people to a mile of railroad, and at its end, only 543. In Europe there are 3,333 people to a mile of railroad; in Sweden, where the population per mile of road is least, 1,667. The *Gazette* thinks that the present rate of construction in this country cannot be maintained for any great length of time, although the prospects are that there will be a great amount of new construction during the present year.

THE *Albany Journal* says that a freight train on its way from Schenectady to Whitehall, on the Delaware & Hudson road, lost the rear truck of a car in the middle of the train, and on going back to hunt for it, it was found alongside the track about 15 miles from where its loss was discovered. The cars, it is said, were held together by the coupling, while the rear end of the car, which was loaded, had been dragged along upon the rails. According to this, the coupling must not only have been remarkably strong, but very elastic, to allow the truckless end of the disabled car to drag on the rails, and at the same time pull the rear half of the train.

As a match for this story, another is told of a loaded freight car in the middle of a Vermont Central train, which uncoupled itself at both ends while the train was running, and rolled down an embankment, the car behind it at the same time closing up the gap and coupling itself to the car ahead. The car was not missed until the train arrived at its destination, a distance of some ten miles from where the lost car was found.

The Shaw Locomotive.

Mr. Henry F. Shaw, of West Roxbury, Mass., has designed a novel locomotive with four cylinders, which is being built under his supervision by the Hinkley Locomotive Co., of Boston. The advantages that are expected to result from this peculiar construction are increased speed, with less danger of leaving the track, and a much steadier motion while running than can be claimed for or-

suspended at the four corners. When the locomotive is running, a center of forcible motion is established, at the point of the drivers' momentary contact with the rail. From this center there is a cumulative centrifugal force, augmented by both the increasing distance and speed of the counter-weights as they rise from the rail. The power of this force is constantly changing, and this, and the unequal application of the steam power from each cylinder of an ordinary locomotive, as they both vary from their least to their maximum expression, are the great disturbing forces which cause the swinging, oscillating and vibratory motions; and, as is well known, the faster the machine runs the greater is the ratio in which this disturbance is multiplied. To overcome this, it is proposed to use on each side of the locomotive two cylinders side by side, with two sets of rods working opposite each other on the wheels by means of a double crank with a center bearing. The rods on the two sides are quartered in the usual way.

"The wheels have no counter-weights, except that there are two bosses, one for the pin, and another opposite to balance it, so that the wheel itself is perfectly balanced on its center. The two sets of rods on a side will exactly balance each other. The two cylinders on a side take steam and work exactly opposite each other, and the application of the steam power to the drivers simultaneously at two points diametrically opposite will turn them without any forward or backward thrust in their boxes. As one piston is working in the backward stroke, while the other is working forward, they will balance each other, and prevent the alternate backward and forward thrust of the frames or driver-boxes against the axles of the wheels as in ordinary locomotives. Thus, in the wheels, frames, reciprocating parts and steam power, the different motions and forces will all be balanced by exactly similar ones.

The attainment of high speeds, for which there is at present so much striving, can never be realized until the locomotive is in some way more perfectly balanced, and made to run as smoothly as if hauled by another engine."

Before deciding on the value of these claims, we will wait to hear how much is demonstrated by the performance of the engine. With the exception of the double cylinders, which are 10½ × 24 in., and their connections, we find it is the same as the ordinary 8-wheel American locomotive, with 5 ft. 9 in. drivers. Besides the usual frame, it has between the two sets of rods another frame, with boxes for the middle bearings of the double cranks which connect the rods to the drivers. One of these cranks is shown in fig. 1 of the drawings. The main rods join their coupling-rods with a knuckle-joint. These rods are respectively 7 ft. and 7 ft. 6 in. long, and weigh about 110 and 117 pounds. They are made of I channel iron, 4 in. deep, ¾ in. thick, and the head 1½ in. broad. The two cylinders on a side have but one steam chest, valve and seat. A valve stem from the center of the valve connects with the usual rocker and eccentrics. The valve seat, with its two sets of steam and exhaust ports, is shown in fig. 2. Fig. 4 is the face, and figs. 3 and 5 are sectional views of the valve. One-half is the usual D valve (fig. 5) and the other (fig. 3) is a double D or B valve, with a bridge in the center of each half, around which the steam passes from the chest to the cylinder, and from the cylinder to the exhaust. Fig. 6 is a piece of the valve seat (fig. 2) cut and placed with sections of the valve (figs. 3 and 5) to show the relation of the valve and ports when the valve is in the center of its travel. Fig. 7 shows it just beginning to take steam, the D valve through the open port at B, and the B valve on the left where it projects over the edge of the valve seat at A. Fig. 8 shows the valve at the end of its travel, with the steam



Fig. 1.

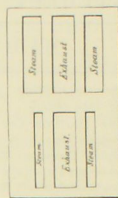


Fig. 2.

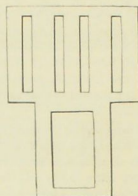


Fig. 3.



Fig. 4.



Fig. 5.

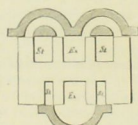


Fig. 6.

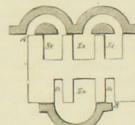


Fig. 7.

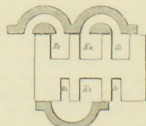


Fig. 8.

inary engines. The following, from the inventor's description of the machine, will convey an idea of its character:

"The attempt to balance reciprocating and rotary motion against each other is a failure. It is only by putting reciprocating motion against reciprocating, and rotary against rotary, that the problem can be solved. The internal disturbing forces of a locomotive are supposed to be balanced by the counter-weights in the drivers, which are adjusted simply in respect to the motion around their centers as they move when the machine is

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ports wide open. The valve has 4 inches travel, $\frac{3}{4}$ inch outside, and no inside lap. The steam ports are 1×8 in. under the D valve and 2×8 under the other. The exhausts are $2\frac{1}{2} \times 8$.

Paige's Sleeping Car.

The Wason Manufacturing Co., at Brightwood, Mass., which has long been noted for superior excellence in passenger car work, has just completed a magnificent parlor and sleeping coach, in accordance with designs originated and patented by the superintendent of the works, Mr. W. H. Paige. The interior of the coach contains 12 sections, and will accommodate 48 persons. The most noticeable feature upon entering the vehicle, is the entire absence of the usual upper berths, which are so cumbersome, and which add so much to the weight of this class of coaches. The berths, which consist of heavy canvas stretchers, are suspended from a frame, and drawn perfectly taut, so that there is no deflection, thus affording a most comfortable and roomy couch for the occupants. There are two large windows to each section, of clear plate glass 26×43 inches, suitably protected by rubber weather strips, and provided with rich and heavy curtains, so arranged that occupants of the uppermost berths have the same privileges as those of the lower ones. In the daytime the berths are stowed away between the seats, the foot-boards dropping between the seat backs. There are no spring-locks, catches, bolts or hinges, no chance for any rattling or jarring, there being only one detachable piece to a section.

The interior finish is in solid mahogany, the main roof has oak ceilings, the clear-story ceiling is of cloth tastefully ornamented, and there are swing-ventilators at the ends. The seats have high backs and are exceedingly roomy and comfortable. The seat cushions are not used for beds, and the rich crimson plushes are thereby saved from much premature wear and tear. The lighting is by five nickel-plated, double-burner lamps, furnished and designed by Williams, Page & Co., of Boston, to correspond with the nickel-plated trimmings of the car. The floor is covered with one piece of carpet running lengthwise, with bordered rugs between the seats. At one end of the car are the porter's room, gentlemen's toilet and closet, and room for Baker heater; while at the opposite end are a linen closet and ladies' toilet elaborately supplied with all necessary requisites. The heater-pipes are recessed into the car sides, with a wire panel in front to protect clothing and prevent disagreeable odors from damp boots.

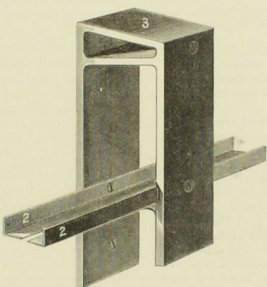
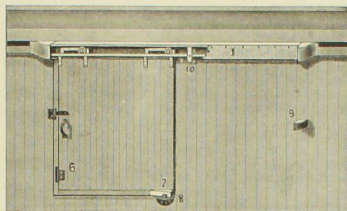
The exterior of the car is painted a rich dark color, highly ornamented with gold and colors in Eastlake designs by Capt. E. C. Pierce and Mr. Elisha Childs. The total length of the car is sixty feet. It is mounted on four-wheel trucks with M. C. B. standard axles, wheel base eight feet. Paige's wrought metal wheels are used, and French's elliptic and Ludnam springs. These trucks are claimed to ride much easier than six-wheel trucks. The weight of the car is a fraction less than twenty-one tons. The whole structure is provided with the latest and most effective appliances for the safety and comfort of passengers. It has been constructed for Superintendent Paige, and, as a model of design and workmanship, is worthy of the long-established and well-earned reputation of its builders.

He stood with his back against the front door of the street car. Every one else had a seat and he anxiously watched each face for symptoms of getting out for over three miles. It grew wearisome, and he finally shifted his weight from one foot to another and exclaimed, "By me soul! have none o' yeessany homes to go to?"

Pratt's Improved Freight Car Door.

This improved method of hanging the doors of freight cars has been very fully tested upon a number of important freight lines, and has been found to possess all the advantages that are claimed for it. The door, as will be seen from the engravings, is hung from the top by anti-friction rollers. The details of the construction will be understood by the following references to the parts as numbered in the cuts:

1. Wooden cover for the roller-tracks and running parts, the front of which is in part broken away to show the inside apparatus. 2. Tracks of



angle-iron, $1 \times 1 \times \frac{1}{4}$ in.; shown also at top of door with wheels resting on them. 3. Cast-iron frames for the cover, and supports for the track. Only one is shown in the cover, at 10, but four or five of them are used. 4. Wrought or malleable iron hangers for door. 5. Wheel with wrought-iron axle. These wheels roll on the tracks, and the hangers, which are carried by the axle, move through the open space between the tracks. 6. Front catch, holding the door securely when closed. 7. Borel or wedge at bottom of door to make a tight joint when it is closed. 8. Bottom guide. 9. Rear stop. 10. Same as 3.

Under the back edge of door at 7, is a cleat running from top to bottom, which closes tight against another cleat on the car. The front edge of the door also closes against a cleat. These cleats, together with the catch at 6, the wedge at 7, and the cover over the top, make the door fit very tightly when closed. The least opening re-

lieves the wedge and catch, and the door then rolls wide open freely.

The advantages claimed for this improvement, and which are admitted without qualification by all who have used it, are a very great economy in repairs and renewals, as well as in respect to car service while such work is being done; also, costing less than the ordinary door fittings. No special tools or machinery are required, and the materials used are what every car shop has on hand or can readily obtain. There is no friction, and no force is necessary to move the door on its track. It protects the freight from sparks, dust, and storms, is strong and simple in all its working parts, cannot get out of order, adds no additional weight to the car, and is a complete remedy against the loss and destruction of doors, which every car-builder now finds so annoying. It has been adopted by a number of conservative and well managed roads, including the Boston & Albany; Eastern; Fitchburg; Old Colony; and Providence & Worcester. It is also being tested by the New York Central; Lake Shore; C., C., C. & L.; and other leading lines.

The Wason Manufacturing Co., of Springfield, Mass., have orders in hand for several months ahead. A force of 600 men is employed, and the works are now turning out one passenger and five freight cars a day. Of passenger day cars, the company is building 35 for the Central of New Jersey, making a total of 282 built for that road since 1862; also 10 for the Gulf, Colorado & Santa Fe; 8 for the New Haven & Northampton; 6 for Maine Central; 10 for Pittsburg & Lake Erie; 5 for Connecticut River; 4 for Conn. & Passumpsic; 2 for Portland & Rochester; 6 for Galveston, Houston & Henderson, and 2 for European & North American. Of drawing-room cars, 7 are for the Boston, Montreal & White Mountain Line, and 2 for Sioux City & Pacific. Twenty baggage cars are also being built for different roads; 200 box and 500 flat cars for the Southeastern of Canada; 150 box cars for the Quebec & Ottawa Air-Line, and 50 flats for the Houstonian.

More than 40 of the passenger cars will have the new style of inside finish designed by the superintendent, Mr. W. H. Paige, and which was first applied to three cars built for the Wisconsin Central. It is solid mahogany, quite plain, and notable for the absence of surface joints without beads or mouldings. The window panels are one piece from wainscot to ceiling, their plainness being relieved by a grooved border running about $1\frac{1}{2}$ in. from the beveled edge. Over each window is a sunken panel fluted in the same way, also a rosette carving. A plain mahogany sill turns the ceiling into the clear-story. There is not an unnecessary piece used, nor is there any apparent effort to produce ornamental effect except in the door-posts and lintels, which have a beautiful design and a little carving in harmony with the general style. The simplicity, neatness and solid appearance of the wood-work, together with the large windows, which have 20×30 inch glass, make a very cheerful and attractive looking car. Some of the head-lings are of oak, and others of canvas. The only gilt moulding in the car is a light one running around the clear-story head-lining.

Saw dust has for a long time received but a begrudgingly appreciation, its use having been confined for the most part to puddings, fuel, cooling ice, and embellishing the floors of cheap restaurants. But we now hear of saw-dust bricks, saw-dust car-wheels, saw-dust fence-posts, railroad ties, windows and door frames, moldings, and what not.

Detailed Cost of a Drawing-Room Car.

The following are the items in detail of the cost of material and labor in the shop, of one of the drawing-room cars built in 1880 at the Allston shops of the Boston & Albany Railroad, and under the supervision of Mr. F. D. Adams, the General Master Car-BUILDER. A description of this car was published in our January issue:

COST OF TRUCKS.

Steel Axles (8) M.C.B.			
Standard.....lbs. 2,292	.07	\$160.44	
Allen Paper Wheels,			
42 inch....." 12	\$100.00	1,200.00	
Equalizers (8).....lbs. 1,235		171.50	
Elliptic Bolster			
Springs.....lbs. 2,066	.09	185.94	
Vose's Graduated Equal-			
izer Springs....." 8		85.00	
Brasses, M. C. B. Stand-			
ard.....lbs. 117	.23	26.91	
Channel Iron....." 1,105		36.47	
Pieces Beam Iron....." 4		1.98	
Box Covers, Springs and			
Bolts....." 12	.26	3.12	
Wrought Washers and			
Nuts.....lbs. 2,999		4.70	
Wrought Iron.....lbs. 2,999		77.60	
Brake Springs (8)....." 57	.06	3.42	
3/4-inch Chain....." 108	.05 1/4	5.67	
Screws....." 16		.23	
Rubber Tubing.....lbs. 3,476	.03	104.28	
Castings.....ft. 6		.18	
Pine Lumber.....ft. 898	25.00	21.70	
Oak....." 898		5.00	
Paint Stock.....			
Labor and Freight on			
Wheels, and Machine			
Shop Bill.....		43.60	
Labor on Trucks.....		125.00	
Total.....		\$2,262.89	

COST OF CAR-BODY.

Ash Lumber.....ft. 1,780	48.00	\$85.44	
Oak....." 596	25.00	14.95	
Pine....." 3,800	25.00	95.00	
Hard Pine Lumber....." 1,985	30.00	59.55	
Whitewood....." 2,400	36.00	86.40	
Mahogany....." 5,800	170.00	986.00	
Castings.....lbs. 1,280	.03	38.40	
Wrought Iron and			
Washers.....lbs. 1,700	.02 1/2	42.50	
Plate Iron for Panels,			
etc.....lbs. 179		7.03	
Hand Railing....." 227	.03	8.31	
Double Iron Body Bol-			
sters....." 1		34.90	
Miller Hooks....." 2	16.37	32.14	
" " Springs			
" (2).....lbs. 64	.08 1/2	5.28	
Miller Hook Side			
Springs.....lbs. 64	.06 1/2	4.16	
Miller Hook Buffers....." 2	5.31	10.62	
" Levers....." 2	1.62	3.24	
English sheet iron.....lbs. 118	.05 1/2	6.49	
Russia....." 6	.13	.78	
Galvanized....." 140	.10 1/2	14.70	
Sheet Copper....." 23	.28	6.44	
" Brass....." 4	.34	.96	
" Zinc....." 27	.07 1/2	2.02	
Tin.....sheets 433		29.00	
Bright Tin....." 16	.09	1.44	
Solder.....lbs. 30	.14	4.20	
Rods for Hoods, etc....." 11 1/2	.04	.46	
Timed Nails....." 4 1/2	.13 1/2	.61	
Clout....." 6 1/2	.10	.65	
Bolts....." 30	.15	4.50	
Globe Ventilators, 5 in.			
Cast Iron Ventilator			
Frames....." 17	.08 1/2	1.42	
Coarse Wire Cloth.....ft. 5	.18	.90	
Brass....." 82	.34	27.88	
Copper Tacks.....papers			
Screws, Brads, etc....." 7	.15	1.05	
Nails....." 32.00			
Machine Bolts....." 5.50			
Lag Screws....." 4.10			
Body Bolster Plates....." 2.70			
" 1.50			

Mixed Paint.....lbs. 60	.10	6.00	
Golden Ochre in Oil....." 10	.16	1.60	
Burnt Umber in Japan....." 3	.28	.84	
" Sienna....." 2	.28	.56	
Lampblack....." 3	.20	.60	
Princes Metallic Paint....." 23	.06	1.38	
Putty....." 8	.06	.48	
Lead....." 4	.10	.40	
Fire Bronze (3 papers)....." 1/4		1.00	
Corn Starch (for filling			
wood).....papers 40	.09	3.60	
Varnish.....galls. 4 1/2	4.00	18.00	
Shellac (2 1/2 lbs. to the			
gallon).....galls. 7 1/2	2.50	18.75	
Oil, Boiled....." 8	.60	4.80	
Turpentine....." 3	.47	1.41	
Japan....." 2	1.50	3.00	
Benzine....." 2	.13 1/2	.27	
Alcohol....." 2 1/2	2.14	5.35	
Gold leaf.....books 40	.35	14.00	
Nickel leaf....." 8	.20	1.60	
Chinese Vermilion, paper.			
Sand-Paper.....sheets. 125	.01	1.25	
Plain Plate Glass, 30 1/2 x			
40.....lights. 18	8.05	144.90	
Ground Plate Glass, 30 1/2			
x 40.....lights. 2	18.05	36.10	
Figured for Toilet Room,			
11 x 38.....lights. 1		7.29	
Figured for Door....." 2	9.50	19.00	
Plain Plate, 20 1/2 x 30,			
lights. 4	7.65	30.60	
Dome Sash, diamond cut,			
18 1/2 x 6.....lights. 44	1.50	66.00	
Cathedral Sash, 2 x 2,			
lights. 264	.01 1/2	3.96	
Mirror, 17 1/2 x 33....." 280	.03	8.40	
Rubber Molding.....ft. 50		5.41	
" Pins....." 34		.50	
Window Pulleys, \$2.50			
per dozen....." 125		7.09	
Window Sash Cord.....ft. 1.80		1.80	
Stove Pipe Ring, 7-in.			
" " 8-in....." 1.25		1.25	
Oil Carpet.....yds. 1.34		1.34	
Baker Heater and Pipes			
Westinghouse Automatic			
Brake....." 1.75		1.75	
Plated Cuspidors....." 18		32.25	
Center Lamps, Williams,			
Page & Co., 4 burners			
Side Lamps, complete....." 1		6.50	
Smoke Bell for Side			
Lamp....." 2		1.25	
Hacks for Window Panels			
Hat Hooks....." 12	8.00	96.00	
Plumbing....." 19	1.50	28.50	
Labor on Car Body....." 36	9.27	333.72	
Mahogany Chairs....." 10		31.32	
Ash Lumber, ea. chair			
Silv. Plated Bands....." 15.15		545.40	
Plush....." 15.15		545.40	
Screws....." .07		2.52	
Paint Stock....." .09		3.24	
Castings....." 1.08		38.88	
Cotton Cloth, etc....." .15		5.40	
Upholstery Shop and La-			
bor, ea. chair....." 18.10		651.580	
Total Cost of Car			
Body and Furnish-			
ing....." \$8,479.87			
RECAPITULATION.			
TRUCKS: Material.....	\$2,094.29		
labor and Freight on			
Wheels....." 48.60			
Labor....." 125.00			
Body: Lumber....." 1,835.54			
Iron, etc....." 350.53			
Paint Stock....." 84.97			
Glass....." 313.26			
Furnishings....." 496.20			
Upholstering....." 924.23			
Miscellaneous....." 1,100.31			
Labor....." 2,269.17			
			6,864.21
36 CHAIRS: Material for each, 30.78	964.08		
Labor for each....." 18.10	651.58		
			1,615.66
			44.88
Total Cost of Car.....			\$10,742.76

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TRUSS-ARCH SIDE-FRAMING FOR PASSENGER CARS.

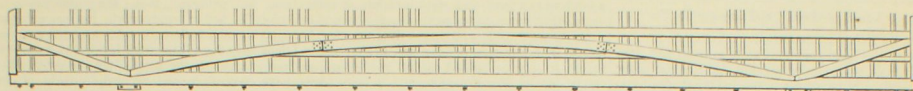


Fig. 1.

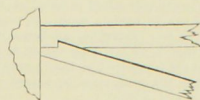


Fig. 2.

THE engravings illustrate a method of side-framing for passenger cars that has been in use upon the Boston & Albany road four or five years, and with such good results that the plan will be permanently adhered to by that road in passenger car construction. It is simply an improvement which dispenses with the ordinary truss-plank, and was designed by Mr. F. D. Adams, the well-known General Master Car-BUILDER of the road, who for years past has been endeavoring to diminish the weight of passenger car bodies, by dispensing with all superfluous material, without impairing their strength or durability.

It will be seen by Fig. 1, which represents the side frame below the windows, that the ordinary truss plank is superseded by a central truss-arch, and a counter-brace at each end. These are of $\frac{3}{4}$ by 5 inch ash timber, the arch consisting of three pieces, with the joints squarely and carefully butted and held by a piece on the back between the window posts, firmly screwed on. It is held that a single heavy plank placed upon its edge, although very stiff, does not present all the resistance of which the same amount of material is capable when in the form of a truss. Or, in other words, the arch with the end braces, as shown, is stronger than the same quantity of timber in one piece and of the same length. This has been sufficiently proved by the performance. Instead of a yellow-pine plank, $2\frac{1}{2}$ x 12 inches, one ash plank of much smaller dimensions is employed, the grain of each piece running straight from end to end, the center rising to the belt under the windows, and the ends resting upon the bolsters. It is carefully let into the posts and studs so as to secure perfect joints, without which the stiffness would be impaired. The end braces extending from the bolsters to the corner-posts aid in keeping the car up. There is no belt-rail proper, but in its place a piece of timber 1x5 in. is let into the posts just under the windows, and this, with the usual belt below, gives the requisite stiffness to the car wall. The posts are $1\frac{1}{2}$ x $3\frac{1}{2}$ inches. There are no braces between the windows, the car being kept up by the truss-arch, the belts and the main truss-rods. In this way there is a great saving of weight; and the cars with this construction that have been running for years have in no instance been deflected one-eighth of an inch from their original straight horizontal line.

Fig. 2 represents, on an enlarged scale, an improvement by which the counter-braces are let into the belt near the corner-posts, but which is not shown in Fig. 1.

Spurr's Papered Veneers.

The difficulty experienced by car-builders and other artisans in the use of wood, whether solid or in the form of veneer, arises from its shrinking and swelling. Green wood is swollen to the utmost, and if kept in water will remain so, but as it dries it shrinks. In the log, plank or even ordinary thick veneer, the outside dries first and the swollen inside holds the outer drying shell from shrinking as a whole; so it shrinks in small sections which crack away from each other. The longer the drying continues, or the oftener shrinking and swell-

ing are alternated, the wider the cracks become, and the more likely is the veneer to peel off.

The veneers designed for papering are cut from the wood in its natural swollen condition, or if not perfectly green, it is soaked, boiled or steamed, in a tight vat. The logs are halved or quartered, and bolted upon a revolving section of a ponderous machine weighing over 30 tons, which, at every revolution, throws off a thin sheet 12 feet long and from $\frac{1}{8}$ to $\frac{1}{4}$ of an inch in thickness. Each sheet as it is cut passes to another machine, which mounts it upon a wet sheet of strong vanilla paper with flour paste, and the two are pressed together by running between large rollers. The wood and paper thus united dry together without cracking, and make a flexible veneer that can be handled, shipped and kept until wanted for use. In preparing it for laying, the combined wood and paper is thoroughly soaked with water until it is fully and evenly swollen. After being applied with either glue or flour paste, it dries quickly and without shrinking, leaving the pores open and the colors of the wood bright and clear. It is then finished in oil, wax or varnish.

Houses built a dozen years ago prove, in the absence of the usual defects of split panels and open joints of the wainscoting, the fact that papered veneers were laid upon the plastered wall at the extreme of swell. Those who have had more than thirty years' experience in cabinet work and ordinary veneering, and after using papered veneers five years, claim for them the following advantages: There is no waste or injury in storing or careless handling, which is not the case with ordinary veneers; many pieces can be cut at once without ruining brittle wood; one barrel of glue will lay more than twice as much surface; they need but twenty minutes under pressure instead of twelve hours, and the press can be kept going all day; there is no delay for glue to set, and the veneer can be sandpapered at once, without waiting days for the glue to harden.

The ordinary marquetry is natural and artificially-colored woods marked or sawed in, the hot iron and sand being resorted to, to produce the desired effect. By Spurr's method the sawing is done away with by marking in transparent colors on one whole piece of papered veneer, dyeing and shading to suit design, making a flexible and durable marquetry, in simple or elaborate design, laid with caul or rubbed on, French polished or varnished, standing climatic changes and with no working up or off of the inlays as in ordinary marquetry.

THE New York, New Haven & Hartford R. R. shops, at Hartford, Conn., are working on the last 100 of a lot of 400 standard box cars for the Union Line, built as shown in drawings in CAR-BUILDER

for October, 1880. They have Van Liew grain doors, and are marked 40,000 lbs. capacity.

Mr. Packard, the Master Car-BUILDER, makes use of templates in getting out wood as well as iron work, so as to make the parts interchangeable. He makes his outside car doors in a frame which has a bottom strip around it just inside of the rim, and a centre-piece, both faced with iron plates, against which the nails are driven and clenched. In this way the doors are of uniform size and perfectly square. A similar frame, with the bottom covered with iron plates, is used in making the grain doors. The outside doors are made perfectly plain outside, without strips or panels, which are liable to catch the water and rot out the doors of the old style of cars.

Mr. Packard has also just completed a very neat engine cab of black walnut, trimmed with mahogany. The ceiling is walnut and ash. The outside ornamentation is in gilt and black. The locomotive, No. 50, for which it is designed, has some noteworthy peculiarities in its valve-gear. Its cylinders are 15x22 inches, with steam ports 16x11 $\frac{1}{4}$ in., and exhaust ports 16x2 $\frac{1}{4}$ in. The valves have 1 $\frac{1}{2}$ in. outside, and 5-16 in. inside lap. The forward eccentric has 6 $\frac{1}{2}$ in. throw, and the backward 6 in. It also has steel cross-heads and rods which have been in since the locomotive was built in 1868, and they seem to be as good as new. It is the 8-wheel American pattern, weighs 33 tons, is the fastest engine of her size on the road, and makes a very economical record both as to fuel and repairs.

Mr. John Henney, the Master Mechanic at the shops, is building a new switching engine with six four-foot drivers and no truck. It has 16-22 in. cylinders, and will weigh 30 tons. The "Altair," a locomotive of the road that was illustrated in the CAR-BUILDER for May 1880, and which has a Buchanan water-table, is making a very economical fuel record. A competitive trial between it and another locomotive of the same pattern, except that it had a plain fire-box, was recently made on the road between New Haven and Springfield, with the regular fast passenger train, which usually has eight cars. The record for the "Altair" was 28 $\frac{1}{10}$ pounds of coal burned to each mile run, while the other engine burned over 45 pounds per mile. An Ashton blow-back safety-valve has since been attached to the latter, and it now burns less coal.

THE following recipe for keeping lamp chimneys from cracking is taken from the *Diamond*, a Leipzig Journal devoted to the glass interest: Place your tumblers, chimneys or vessels, which you desire to keep from cracking, in a pot filled with cold water; add a little cooking salt; allow the mixture to boil well over a fire, and then cool slowly. Glass treated in this way is said not to crack even if exposed to very sudden changes of temperature. Chimneys are said to become very durable by this process, which may also be extended to crockery, stoneware, porcelain, etc. The process is simply one of annealing, and the slower the process, especially the cooling portion of it, the more effective will be the work.

Communications.

The Slow Growth of Passenger Traffic.

To the Editor of the National Car-Builder:

I notice from time to time in railroad and other journals, attempts to account for the stationary condition of passenger traffic and the profits derived from it, as compared with the steady increase of freight tonnage and earnings. The reasons for the great disparity in the two classes of traffic are numerous, and to state them all with any thing like accuracy would far exceed the limits of this article. Still more difficult would it be to suggest any practical means for overcoming this disparity by increasing the productiveness of passenger traffic so as to make it proportionately as remunerative as that of freight. If there was a much larger average number of passengers carried per train at existing rates of fare, the earnings would of course be correspondingly increased. One of the most prominent reasons, as it seems to me, why this average continues without any marked increase, is the radical change that has taken place during the past ten or fifteen years in the business intercourse between the great cities and country tradesmen and dealers. In former times every country merchant made regular spring and fall trips to the seaboard cities to make his purchases, examine the style and quality of goods in detail, and keep himself posted in respect to the markets. So general was this semi-annual movement, that every available passenger car was at such times brought into use, and great was the harvest reaped by the railroads from this periodical tide of travel. But now all is changed. The agent and drummer system enables the country merchant to purchase by sample in his own store, and thus save the expense of traveling himself. The drummer's one trip is substituted for the many trips of the merchant, to say nothing of the increased facilities afforded by the post-office department, telegraph and express companies, all tending to decrease the revenues of passenger traffic. And, in addition to this, the almost perfect commission system established in all the large cities, and even in the smaller towns, by which innumerable transactions, large and small, are made through the medium of agents, and without the presence of the principals, has had a similar tendency.

While these and other causes have operated to the injury of passenger business, another set of causes has powerfully contributed to swell the freight tonnage to its present enormous dimensions. A large percentage of this is derived from the activity of emigration to the new States of the West and the increase of products resulting therefrom. These emigrants have never been accustomed to travel either for business or pleasure. When they reach their new homes they settle down to hard work, and become producers of grain, live-stock and other things for transportation to distant markets, and which swells the freight traffic from year to year, while the producers themselves are rarely seen upon passenger trains, and contribute little or nothing to the earnings of this class of traffic. This relation of production to freight transportation will not of course continue always, but only so long as new land is to be brought under cultivation and new mining and other resources developed. The period of exhaustion may be comparatively distant, but it is sure to be reached one of these days.

There is a large class of people, however, who travel for pleasure or business, according to their circumstances and means. Of the patronage of this class the railroads can always be sure, its bulk in the aggregate being affected only by good or bad times. The problem to be worked out is a better

development of this class of traffic, so that people can travel according to their means rather than according to a fixed and rigid schedule of rates; or, in other words, the passenger system should be made more flexible and more like the freight system than it now is. This may be impossible, except to a very limited extent, but something can be done in this direction, and is being done already, in the summer excursion travel, for example—a phase of passenger business which is becoming more popular and profitable every year. Provision must be made for the large class of people who can only afford to travel at low fares, and who can be made a source of profit to the roads in a way somewhat analogous to return freight; that is to say, they should be carried at rates that are better than to haul empty seats, in cases when the seats must be hauled any how, whether empty or filled.

The situation as to passenger and freight business seems to be that while the latter is to be had for the asking, and is even forced upon the roads in consequence of its accumulation and magnitude, the former has to be nursed, and coaxed, and worked up. If all the people travel now who can afford to travel, or who can be inveigled or persuaded to travel by cut rates and the artful inducements of agents, then has the passenger business apparently reached its limit. The situation manifestly can not be changed except by a general and uniform reduction of rates. People see that freight rates have been largely, steadily, and it is safe to say permanently reduced, and they very naturally conclude that passenger rates can bear a similar reduction, especially as when contrasted with freight rates on the basis of ton for ton there is such an enormous disproportion between the two. But, inasmuch as the railroads claim that passenger rates are as low as the expensive and luxurious equipment will warrant, would it not be well to consider the expediency of adopting to some extent the European system of class-cars as a means of increasing the traffic? I cannot see how it would clash very seriously with our democratic ideas and tendencies. Human nature is essentially the same every where, and society divides itself into classes upon one basis or another. With us the universally recognized basis is wealth, and this is constantly illustrated in the matter of hotel charges, church pews, seats at the opera, and even in railway car accommodations. We already have emigrant cars, day coaches, parlor, drawing-room and sleeping coaches, special cars for railway officials, and special trains for whoever wants them and can foot the bill. In all the channels of trade every one pays his money and takes his choice, and why not in respect to cars? If plain and cheap cars and correspondingly low fares meet the wants of a large class of the population in England and elsewhere, and at the same time yield a profit to the roads, why can not the same system be rendered equally serviceable in this country? H. C. W.

Car Painting—A Plea for Dark Colors.

To the Editor of the National Car-Builder:

The reported discussions of the Master Car Painters' Association at its annual meetings, in connection with reports of what has been said at the recent monthly meetings at the rooms of the Car-Builders' Association in New York, reveal a wide difference of opinion, not only in respect to the utility of light and dark colors upon cars, but also in the matter of first cost and maintenance during the five or six years a car is expected to run after it is painted. So far as my own experience enables me to judge, I am strongly in favor of dark colors, and although my individual taste has little to do in deciding what shall be the color of a car in any given case, I am glad, nevertheless, to see that the number of dark-colored cars is steadily increasing.

The recent changes that have been made from light cars to dark ones, upon some leading roads, are an evidence that the importance of color is better appreciated by managers and superintendents than it once was. The associations have done little thus far but talk about the matter, and in the mean time the road officers have stepped in and decided in favor of dark colors, relieving the master painters of the responsibility as well as the credit of the performance. Inasmuch as the diversity of opinion upon this point among painters prevents them from coming to any definite understanding in regard to it, I am willing that others should decide the question, so far as it can be decided.

The matter of cost, durability and maintenance is the main thing, and painters therefore can more profitably give their attention to the manner of doing the work, to the choice and manipulation of materials, and their adaptation to the end sought. In the economies of the paint shop, sentiment should not be mistaken for talent, nor mere personal regard for ability. The notion that almost anybody can paint a car is fast fading away. The materials which a painter has to handle are substances which have their origin in nature's laboratory, or they are the products of the best scientific skill, and, in order to handle them successfully, their properties must be thoroughly understood. It is quite clear to my mind that just as good work can be done in dark colors as in light ones. It is simply a question of pigments and their proper selection and mixture, and not of black or white, brown or yellow.

A few years ago our friends, the varnish makers, added to their stock in trade a mysterious compound called patent primer, which enabled painters to do their work better and quicker, and use much less material than under the old lead-and-oil system. The vendors of these patent priming mixtures say that they effectually fix the pores of the wood by rendering them non-absorbent and more capable of holding out the varnish, and that hence it is both unnecessary and injurious to waste lead and labor in building up a body of paint for that purpose. A coat or two of patent rough-stuff followed by a coat or two of color, and the car is ready to varnish in ten days. This ready-made method of car painting has had its influence even upon painters who were not carried away by the patent primers, and may be seen in the thin-skinned painting now so abundant; so thin, in fact, that in some cases the kind of wood used for panels can be readily distinguished through the transparent film. Experience has clearly proved that fluids such as oil and varnish are not so good a protection to wood as when the oil is combined with a pigment, and when the varnish has a film of pigment between it and the wood. Both are viscid substances, and when raised above their normal temperature of 65° they continue to be absorbed by the wood. Car bodies are often, when standing in the sun, raised to a temperature of 75°. As I do not think it possible that any such change as coagulation can take place in any combination of ingredients containing linseed oil, it is therefore quite improbable that any kind of primer, patent or otherwise, can cease to be absorbed until after it has become hardened by the action of solar or artificial heat much higher than we have in our paint shops. It is not very clear, therefore, how the "fixing of the pores" is accomplished, but the absorption of the varnish can be prevented by a sufficient number of coats of paint, of lead or other similar pigments of dense nature, between it and the wood. Varnish and paint are not identical, and neither of them alone will perform the work of both. Painters seem to have lost sight of the fact that varnish requires a solid, abundant and non-porous basis between it and the wood, to prevent absorption and enable it to resist the ele-

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ments at work on its outer surface. It is easy to ascertain what number of coats are necessary to protect both the wood and varnish. If one coat will do it, why put on more? If a panel, for instance, is coated in parts with from one to eight coats of paint, and also varnished, the varnish will be found to wear in proportion to the coats of paint under it. Lead is unquestionably the best pigment known for painting under varnish. When properly mixed, it is a better protection to the wood than anything else, and forms a dense and non-porous body to hold out the varnish. There can be no objection to lead for filling-up coats on cars that are painted dark, and the sooner those who do not use it for this purpose throw aside patent primers and surfacing mixtures, the sooner will their work be more satisfactory to themselves and others.

I am assured by many car painters of large experience that the amount of labor and material up to the color coats is precisely the same on light and dark-colored cars, so that the extra cost of painting dark cars must be in the cost of the dark material for the color coats. A comparison of the items of cost will therefore be interesting.

Three coats of dark color, $3\frac{1}{2}$ lbs. to a coat, at 44 cts. per lb., will be \$4.62; labor, at \$2 a coat, will be \$6; making a total of \$10.62 for the three coats. It usually takes four or five coats of light color to cover solidly. But I will say four coats of 7 lbs. to a coat, at 18 cts. per lb., or \$5.04; labor, \$2 a coat, will be \$8, making a total of \$13.04, leaving a balance in favor of dark color of \$2.42. While it only takes from three to six days to coat the dark car, it takes from four to eight days to coat the light one, making quite an important difference when time is an object. It will be seen that the dark car has received only $10\frac{1}{2}$ lbs. of paint in the three coatings, as against 28 lbs. in the four coats of the light car. It is safe to say that in four cases out of five, where dark colors have proved less durable than light ones, the failure is due to the insufficiency of paint put on them. It would be only fair to apply the difference of $17\frac{1}{2}$ lbs. of paint to the dark car, to put it on an equality with the light one. It is generally admitted that dark surfaces absorb solar heat much more than light ones, but how far this theory applies to painted surfaces is yet to be decided. So far as my own observation extends, I have found very little difference in the two cases. I have often noticed dark panels surrounded by light-colored surfaces, and the panels were in a better condition than their surroundings. Recent researches indicate that the effect of solar heat depends less upon the color than upon the coloring matter used. Like many other things in connection with car painting, this heat theory lacks confirmation. Without some good evidence in its support it cannot be urged as an argument of any importance against the use of dark colors for cars.

OCCASIONAL.

Car-Builders' Monthly Meeting.

The subject for discussion at the February meeting at the association rooms, 113 Liberty street, was Uniformity, and Improvements in Car Construction.

Mr. Forney spoke of journal bearings and the confusion which existed in regard to standard patterns. A lithographic engraving was prepared by a committee of the association several years ago, for the purpose of supplying a standard for bearings, oil boxes and pedestals, but the engraving was so defective in showing the journal bearing and key, that they could not be made exactly alike by different pattern makers. The draughtsman had put in a great many small fractional measurements, and upon adding them up they were found to disagree with the long measurements, the result being that in some cases the

bearings and keys of different roads were not interchangeable, and trouble had also been caused by the breaking of the lugs of the brass bearings. In this connection, Mr. Forney mentioned the fact that there were already over a hundred different patterns of steel rails in use on the roads of the country, involving great expense in the making and changing of rolls to fill orders. The same might be said in regard to the various patterns of the different parts of cars. If full sized drawings were made of all the standard brake-shoes now in use, they would cover the four sides of the room in which he was speaking. The necessity for duplicates was, of course, greater for those parts which required frequent renewal than for others, and if there could be standards for these, they could be manufactured and kept in stock, like other staple articles; and it was a fact that the M. C. B. standard axle was now being made in advance of orders. He was informed also that some legislation was contemplated in Canada to bring about greater uniformity in the parts of cars, in order to prevent accidents, but that nothing would be done in reference to draw-bars until the Car-Builders' Association could agree upon something and recommend it. The accidents to train men were far more numerous than was generally supposed, and a large portion of them were preventable. There was plenty of work for the car-builders to do in this direction.

Mr. J. H. Raymond, of the Western Railroad Association, said that in regard to this matter of uniformity, there was, as it seemed to him, a very important question behind and below what had been suggested by Mr. Forney, and that was the best method of securing unity of action on the part of road managers. Take, for instance, the single item of car couplings, in reference to which inventors and master car-builders seemed to have been working at what is really a paradox, namely, to get up a coupler that would save life and property, be automatic, and at the same time be adapted to the present form of trucks. This seemed to him to be an impossibility. He had a notion that the self-coupler which was going to be adopted by the railroads of the future had been already invented, although he did not know which one it was, and he also doubted whether the inventor himself knew. Whoever he was, that man was going to make more money out of railroad equipment than any man has in the past. A standard self-coupler was a necessity. Train accidents were a frightful thing; they were not all reported by the railroad officials, and the people of the country would some day wake up to it, and then there will be trouble—greater trouble, perhaps, than from the Granger movement. The Master Car-Builders' Association had done more and better work in this direction than any other association in this country; but he would ask the question without answering it, To what extent is the standard axle to-day introduced? He thought he had in his office no less than 225 models of brake-shoes in use on western roads, and which are not interchangeable. These things ought not to be so; and the question to be determined is how to get standards into use. With the Western Railroad Association, which had to deal mainly with patents, this was comparatively a simple matter. Questions of infringement were technical questions, and the most jealous branch of the law, for which reason the managers of the roads were obliged to delegate nearly all matters pertaining to it to others. There was a centralization of power in the executive committee of the Eastern and Western Railroad Associations. The road managers did not know any thing about this business, and did not pretend to. It had taken six years to put the Western Association in the position in which it now is.

The obstacles which car-builders have to confront in getting uniformity is a much more serious problem. He would suggest that the first element in its solution was an increase of the efficiency, both of the Master Car-Builders' and Master Mechanics' associations, and that the enforcing of their judgment be made the business of somebody who was competent to do it, and whose whole time and attention should be given to it. It was necessary to get some money, and also to get the ear of railroad managers. The question of patent liability in reference to devices adopted, or to changes made in such devices in the shops, was second to no other in railroad operation. Take, for example, the Tanner, Stevens and Hodge brakes. The principle of one was involved more or less in the other, and all three claims had to be satisfied, because they were valid. As another instance, a watch may embody three distinct patents, all valid, and it is a great advantage in setting with No. 3, to have some one to tell you there is a No. 2 and a No. 1.

Mr. Creamer thought it was a mistake on the part of the car-builders not to have recommended something in the way of a self-coupler, and that if the road presidents and managers had to couple freight cars there would be a self-coupler in use without delay.

After the discussion was closed, several models of cars and appliances were examined and explained. Among these was an improved cattle car by Mr. Geo. F. Patterson; a system of car ventilation by Mr. Wm. A. Shinn; the Mathews car coupler, the Hathaway coupler, the Flinn coupler, and the Gifford coupler; also, a new Buntin car seat frame with rattan-canvas seating, by Mr. Hale, of Philadelphia, and a beautiful car lamp by Mr. Creamer.

Mr. Creamer in speaking of his lamp, made use of the term "clear-story." Mr. Forney claimed that the term was from the Car-Builders' Dictionary, and that its use by Mr. Creamer in such a natural way was evidence that the dictionary was doing some good. Mr. Creamer said the name was first suggested to him by an editor who came to interview him. He thought it was an excellent name, and at once adopted it. Mr. Smith was gratified to find that railroad men in this part of the country were so generally adopting the terms laid down in the book. Mr. Forney announced that a new edition was to be got out, and that it would be an improvement upon the first, especially in the character and quality of the engravings.

THE Railroad Gazette contains the following statistics of railroad accidents:

TRAIN ACCIDENTS DURING 1880.

		Number of accidents.	Killed.	Injured.
January	.....	62	11	50
February	.....	64	16	49
March	.....	65	9	33
April	.....	71	11	45
May	.....	46	30	107
June	.....	56	15	77
July	.....	78	21	109
August	.....	112	49	214
September	.....	124	15	54
October	.....	120	69	137
November	.....	145	40	165
December	.....	125	29	141
Totals	.....	1,078	315	1,172
Total, same months, 1879	.....	910	185	709
Dec. " " 1878	.....	740	204	756

TRAIN ACCIDENTS FROM 1873 TO 1880, INCLUSIVE.

	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
Jan.	178	108	131	60	147	75	113	62
Feb.	133	90	211	81	56	67	88	64
March	112	88	122	109	58	40	61	65
April	101	30	69	2	60	46	59	71
May	79	80	54	94	40	50	37	46
June	90	83	61	52	40	56	64	56
July	90	64	73	79	33	34	81	78
August	150	73	114	78	98	75	79	112
Sept.	106	80	116	129	84	76	78	124
October	88	81	88	103	82	41	104	120
Nov.	76	82	87	180	83	68	86	145
Dec.	80	74	84	88	66	63	69	135
Total	1,383	980	1,201	982	801	740	910	1,078

A New Sleeping Car, Built by the Boston & Albany Railroad.

The drawings show a side elevation and the trucks of a new sleeping-car, recently built at the Allston shops of the Boston & Albany Railroad, under the supervision of Mr. F. D. Adams, the General Master Car-BUILDER.

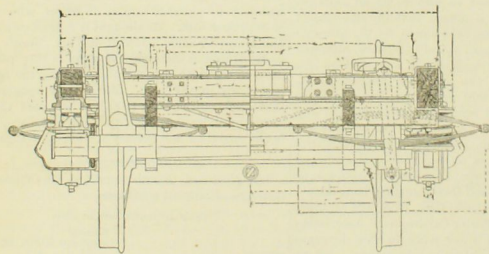
With the exception of the windows, the outside finish and general appearance is the same as that of the drawing-room car built at the same shops, and described in our January issue. The large windows next the ends have lower movable sashes, with ground glass 40x25, and $\frac{1}{4}$ in. thick, with "Sleeping-Car" and border of two straight bands, ground in. The upper fixed sashes have plain ground glass 40x10, the entire opening being 46x41 in. The 16 intermediate windows are 25x41 in., the lower glass being 20x25, and the upper one 20x10. These windows have the usual double sashes.

The inside finish is in solid mahogany. At one end is the gentlemen's lavatory and Baker heater, and at the other the ladies' toilet, linen closet and porter's room. Instead of using pumps, the lavatories are supplied with water from large copper tanks placed overhead. There is no smoking or state room. Upon each side are eight sleeping sections. The mattresses are of striped rep, stuffed with black hair of the quality called "extra drawings." The blankets are Howard's best. The arrangement of berths and seats is in the Wagner style. The seats are upholstered in cherry silk plush, the inside ends being a new design framed with six panels. The window shades are of olive and tan wool crepe, mounted on Hartshorn rollers, and trimmed at the bottom with olive leather stitched with orange silk. They are weighted with an iron rod and adjustable to any height. The berth

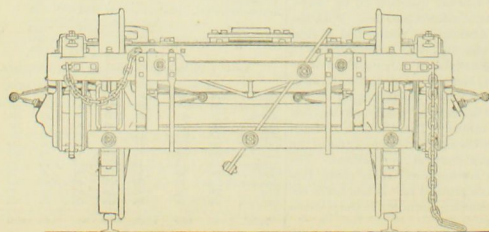
curtains are olive Norwegienne curtain-cloth of spun silk, with a running vine, leaves and flowers, woven in, and trimmed with old gold bands at top and bottom, the upper bands being five, and the lower ones eight inches wide. The lighting is by six of Williams, Page & Co.'s two-burner lamps. These, and the metal furnishings, are all silver plated. In the roof are 20 globe ventilators. The trucks have Allen's 42-inch paper wheels, and are of the same pattern as those under the drawing-room cars. A detailed statement of their cost will be found on another page.

The car-body is 60 ft. long, 9 ft. 6 in. wide, and 9 ft. high from floor to top of clear-story. Has Miller platforms and Westinghouse automatic brakes. The car is one of the three which are especially intended for the night train of the Boston & New York Line, which starts late and arrives early.

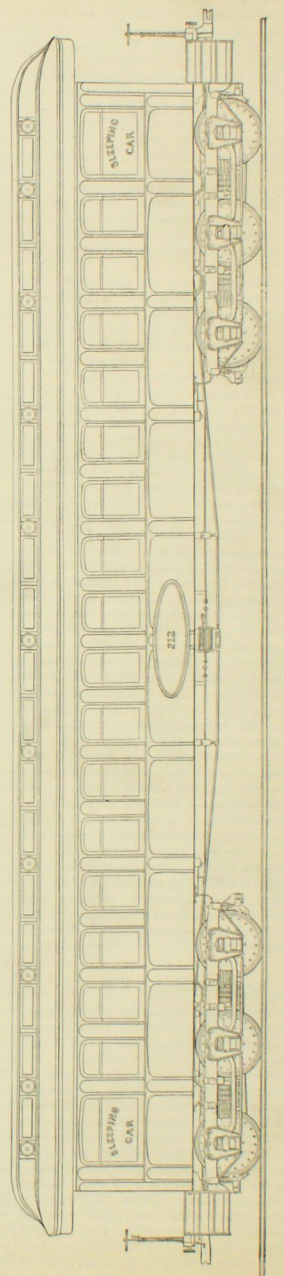
MUCH trouble can often be saved by marking tools with their owner's name, which can be easily done in the following manner: Coat over the tools with a thin layer of wax or hard tallow, by first warming the steel and rubbing on the wax warm until it flows, and let it cool. When hard, mark your name through the wax with a graver, and apply aqua fortis (nitric acid); after a few moments wash off the acid thoroughly with water, warm the metal enough to melt the wax, and wipe it off with a soft rag. The letters will be found etched into the steel.



Transverse Sections.



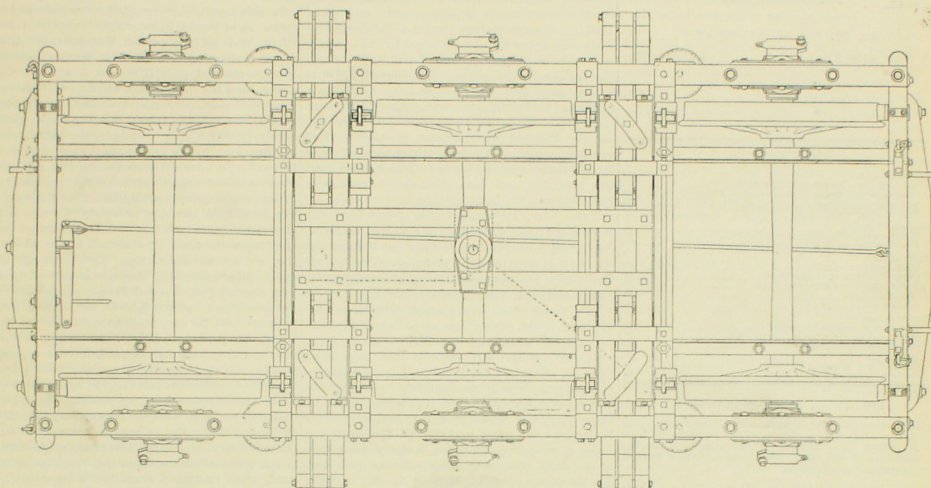
End View



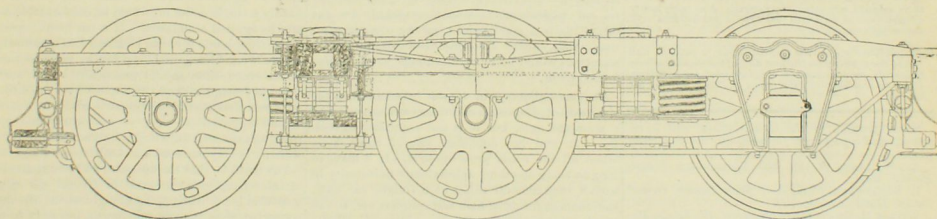
SLEEPING CAR, BUILT AT THE ALLSTON SHOPS OF THE BOSTON & ALBANY RAILROAD.
F. D. Adams, General Master Car-BUILDER.

SLEEPING CAR SIX-WHEEL TRUCK-BOSTON & ALBANY RAILROAD.

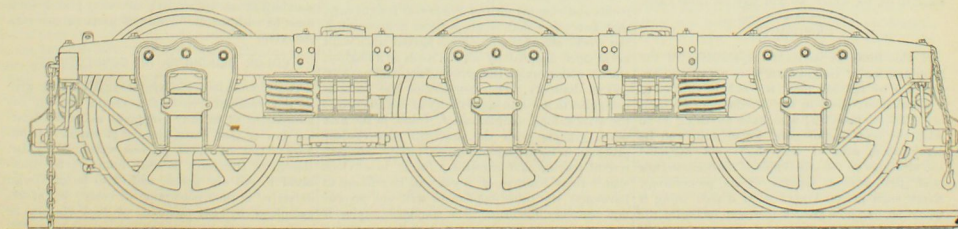
Length of Frame, 15 ft. 6 in.
Width of Frame, 6 ft. 7 $\frac{1}{4}$ in.
Wheel Base, 11 ft.



Plan.



Half-Longitudinal Section.



Side Elevation.

SLEEPING CAR, BUILT AT THE ALLSTON SHOPS OF THE BOSTON & ALBANY RAILROAD.

F. D. Adams, General Builder.



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EDITORIAL ANNOUNCEMENTS.

Addresses.—Business letters should be addressed, and drafts and money orders made payable, to THE NATIONAL CAR-BUILDER. Communications for the attention of the Editor should be addressed EDITOR NATIONAL CAR-BUILDER.

Advertisements.—Nothing will be inserted in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. The editorial department will contain our own views and opinions; and the rest of the reading matter, aside from advertisements, will be such as we consider of interest to our readers.

Contributions.—Articles relating to railway rolling stock construction and management, and kindred topics, by those who are practically acquainted with these subjects, are especially desired. Also early notice of changes in railroad officers, organizations and names of companies.

Special Notice.—As the CAR-BUILDER is printed and ready for mailing on the last day of the month, advertisements, correspondence, etc., intended for insertion, must be received not later than the 25th day of the month.

SUBSCRIPTIONS TO THE CAR-BUILDER will be received, and copies kept for sale, at the following places:

A. WILLIAMS & CO., 283 Washington Street, Boston, Mass.

L. SCHAFER, Cigar and News Dealer, Grand Pacific Hotel, Chicago, Ill.

WILLIE H. GRAY, 306 Olive Street, St. Louis, Mo.

ROBERT CLARKE & CO., 65 West Fourth Street, Cincinnati, Ohio.

OUR extra copies of the CAR-BUILDER for February, 1881, are exhausted. Persons having any of this number to spare are requested to forward them to us, for which we will pay ten cents each.

UNIFORMITY.

If this term, in its special application to the running-gear of freight cars, were not so well understood by railroad men, it would be entitled to a conspicuous place in the Car-Builders' Dictionary. Those, however, who have anything to do with the repairing of cars, know full well its significance, even if they have not attended the meetings of the Car-Builders' Association, nor read the annual reports of its proceedings. Every such person knows what a nice thing it would be, and how greatly it would facilitate the making of car repairs and lessen expenses, if axles, draw-bars, brake-shoes, brusses and the

like, were made to conform to standard patterns so as to be universally interchangeable. So much has already been said about what ought to be done, and the necessity for doing it has been so frequently enforced by statements of the cost entailed upon railroads by the existing diversity of patterns and appliances, that anything further on this score would be a wearisome repetition. Nothing is more certain than that the desired reform will never be accomplished by talk alone, nor by mere recommendations put forth by the Car-Builders' Association. A recommendation is a very good thing in a preliminary way, but a command backed by a power capable of enforcing it, is, practically, a good deal better. It is, in fact, the one indispensable condition of success. But no such command has been issued, or is likely to be, nor is there any power to enforce it other than the managers and high officials of numerous roads acting quite independently of each other.

Under these circumstances it seems pertinent to raise the question whether the desired uniformity is really attainable—whether the obstacles in the way of any general concerted action by all the roads are not practically insurmountable. These obstacles are numerous, not the least of which are the many local standards established by different roads, and which are adhered to with the greater tenacity, not only because they are considered better, but because they are unlike those of other and rival lines. The expense also of changing these local standards to conform to any general standard, even if it were possible to agree upon one would be a very serious matter. So long as the great majority of the roads are doing a prosperous business, it seems idle to talk of the daily increasing interchange of cars, and the enormous cost of keeping up the existing diversity of appliances and patterns. It is something the managers are accustomed to, and they have no time to co-operate in any general movement looking to a hypothetical saving in current expenses. It is also urged as an argument against the adoption of general uniform standards, that so long as such standards shall be rigidly adhered to, all improvements would necessarily be cut off. This is a good point; but the counter argument that, under the circumstances, imperfect standards would be better than none at all, is also a good point.

The car-builders and master mechanics, after six years of discussion and disagreement, adopted a standard axle, but it is not a standard in reality. It will be, doubtless, one of these days, when all the roads grow up to it. If it takes so long to bring about an approximate uniformity in such a fundamental thing as a freight car axle, the chances for draw-bars and couplers are, to say the least, somewhat dubious. Suppose all the road managers and superintendents, backed up by the great controlling magnates behind them, should delegate to the Car-Builders' Association full authority to determine what shall be the standard patterns and forms of construction of every thing pertaining to the drawing attachments and running gear of 8-wheeled freight cars, that two years shall be given them to accomplish the work, and that whatever is agreed upon shall be at once adopted by all the roads as a finality, and so consummate the great reform and have an end of diversity. The members of the Association, glad to have an opportunity at last to correct the evils so long complained of, would, in the first place, grapple with the draw-bar and coupler problem, in its mechanical aspect purely, irrespective of patents and royalties; for it is obvious that if these features of a car can be reduced to harmony, the other appliances will not present any serious difficulties. The standard coupler, if there is ever to be one, has, doubtless, already been invented, although the inventor himself may

not be aware of it. It would of course be a delicate business to select the preferred one out of 2,000 specimens, leaving the remaining 1,999 out in the cold; but it is a matter of business, uniformity requires it, and the selection must be made, although the best one of the lot may not be hit upon.

In this suppositious way, the much desired reform, as it seems to us, might be carried into effect, and all the parties thereto share their proper responsibility. But, alas, we fear the high officials referred to will not do as we have suggested, and the car-builders will therefore have to content themselves with repeating their recommendations. At the annual meeting of the Association in 1879, specific details for the construction of draw-bars, with a view to uniformity, were reported by the committee on the subject, and also some excellent suggestions were made in regard to dead-woods, steps and ladders, running-boards, etc., looking to the greater safety of train men. How far these suggestions have been carried into effect upon the roads represented by the association we are unable to say. Ten years ago, the great importance of a uniform height of draw-bars was recognized and definitely acted upon by the association, but it is safe to say that a large proportion of the cars built since then do not conform to the prescribed height. And why? A want of power to enforce the rule, indifference, a promise to adhere to previous practice which happened to be different, or a chronic aversion to do what was recommended by others. It is immaterial, perhaps, what the reasons may be. One thing is certain, the reform is not carried into effect. And if this is the case in regard to such a simple and obvious matter as the height of draw-bars, what chance is there for a draw-bar that shall be a standard for all the roads? It is useless to talk of the inconvenience of unequal heights in the one case, or of diversity in the other; or in parading statistics in regard to the varieties of materials and pattern, and dead stock for use in repairing so-called "foreign" cars—foreign not only as to ownership, but construction as well, hardly a single detail of which is conformable to any recognized standards. If a car breaks down away from home it has to be studied as a curiosity before it can be repaired. So far as construction is concerned, there should practically be no such thing as foreign cars on continuous lines of traffic, but the different classes, and particularly box cars, should approach as near to uniformity in their running-gear and drawing attachments as if they were owned by one road and built at one shop.

The truth is, that the adoption and maintenance of interchangeable standards in freight car construction is not likely to be brought about by any concerted, simultaneous movement, but only from time to time, and little by little, as imperative necessity and the financial interests of the roads shall require. We have now, approximately, a standard gauge of track, simply because the road system is one of mutual dependence, making it the interest of each road to conform to such standard as an imperative necessity; and so it must be with the uniformity of parts in car construction.

COLOR BLINDNESS IN CONNECTICUT.

The Connecticut Railroad Commissioners give in their annual report the results of the examinations of railway employes under the existing law of that State, the gist of which is as follows: Out of 1,030 persons examined by Dr. Bacon, of Hartford, 35 were found to be color-blind to red and green, and 13 to be otherwise defective in their perception of color; and of 921 examined by Dr. Carmalt, of New Haven, 28 were found to be more or less color-blind. The tests employed were the matching of colored

worsted, would seem to be a match, but which is presumed to be another person. This is the misnomer we say that exp color-blind city between large number see a difference difference bet the red light the green, wi than the gro employe wh afterward tw 21 of the m rectly. Hence law as the only railroad proper caution people accident has l color-blindness occur in statu error of such misperception moral of a bri name traffic i it was going to any analogy in The commis magnify the oi order to prove But even ad strained in res not think the very alarming, person in ten th rail, we accor made.

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the cost of railway transportation. The price and consumption of earth oils were to be greatly augmented, ocean steamers were to be entirely relieved of coal freight and realize a saving of \$5,000 a trip, the city of Pittsburg, owing to its contiguity to the oil regions, was to become the great manufacturing metropolis of the world, and the inventor was to equip at once 300 of its blast furnaces with the atomizing fuel apparatus. The story went the rounds and no more was heard of it, nor has anything been done within the interval of more than two years, so far as we know, to justify the claims and predictions first made. Still, there may be something in it after all; but to inspire confidence, the manifesto should follow the performance, instead of preceding it. Even Keeley's dupes are beginning to learn this after seven years of tuition and misplaced confidence.

GRAMMAR.

worsted. The point involved in these tests would seem to be not whether one person can match worsted precisely as another person does, but whether the person whose color perception is presumed to be defective can not distinguish as readily between red and green signals as can another person whose vision is said to be normal. This is the important point, and the commissioners seem to settle it pretty well when they say that experienced railway employes who are color-blind can distinguish with astonishing facility between red and green flags and lanterns in a large number of cases, and that such persons see a difference in these colors, as others do, the difference being in the intensity of the light only, the red light being to the red-blind darker than the green, while to the green-blind it is brighter than the green. The report further says that 24 employes who failed with the worsteds were afterward tested with flags and lanterns, and that 21 of the number failed to name the colors correctly. Hence the commissioners conclude that the law on the subject is necessary for the protection of railroad property and the traveling public, and they caution people against supposing that because no accident has heretofore been traced directly to color-blindness, no such accidents are likely to occur in future; and by way of illustrating the error of such a supposition, a certain railroad superintendent is said to have opposed the renewal of a bridge because it had carried an immense traffic for 25 years, and he did not believe it was going to break down now—as if there was any analogy in the two cases.

The commissioners are evidently disposed to magnify the color-blind danger to the utmost, in order to prevent the repeal of the existing law. But even admitting that nothing has been strained in respect to the possible danger, we do not think the results as set forth in the report are very alarming, nor do we think that one timid person in ten thousand will travel a mile the less by rail, on account of the representations therein made.

A REVOLUTION IN THE COST OF FUEL.

It is announced in some of our exchanges that an important revolution is pending in the economy of fuel for generating steam in locomotive and other boilers. The material employed is said to be crude petroleum, manipulated in such a way as to secure a perfect combustion and intense heat at a very small cost as compared with coal. The process consists in a simple apparatus for uniting the petroleum with dry, superheated steam, the junction being made within the furnace and within a few inches of a perforated brick retort, by which the fuel is atomized and discharged in a fierce and delicate spray, causing a pure, white flame, and a heat that melts pig-iron in ten minutes. The economy of the thing is, however, the essential point, and in this consists the wonderful stride, the revolution, so to speak, in the cost of furnace fuel and the power, products and processes thereupon dependent. A dollar's worth of this liquid atomized fuel is to do the work of a ton of coal, and locomotives are to be run between New York and Philadelphia for \$4 instead of \$25.

This same discovery was, according to our recollection, announced to the world in almost the same terms in October, 1878, and was based upon experiments made at the Brooklyn Navy Yard. We are not sure but it is entitled to even an earlier date, but at the time mentioned it was blazoned forth in the newspapers as a dead sure thing. The stock of the company was considered so valuable as to defy quotation, and not a share of it could be had by outsiders for love or money. The iron trade was to be revolutionized, as well as

the cost of railway transportation. The price and consumption of earth oils were to be greatly augmented, ocean steamers were to be entirely relieved of coal freight and realize a saving of \$5,000 a trip, the city of Pittsburg, owing to its contiguity to the oil regions, was to become the great manufacturing metropolis of the world, and the inventor was to equip at once 300 of its blast furnaces with the atomizing fuel apparatus. The story went the rounds and no more was heard of it, nor has anything been done within the interval of more than two years, so far as we know, to justify the claims and predictions first made. Still, there may be something in it after all; but to inspire confidence, the manifesto should follow the performance, instead of preceding it. Even Keeley's dupes are beginning to learn this after seven years of tuition and misplaced confidence.

A great many valuable ideas and suggestions in the sphere of mechanics fail to receive the publicity they deserve, because their possessors are terrified at the bugbear of grammar. Whenever they try to put their thoughts in black and white, this frightful apparition is sure to be present and frustrate the performance. Many a shopman who can sit on his workbench during an interval of leisure and clothe his ideas in clear and forcible language, and without a thought of grammatical propriety, is completely nonplused when it comes to putting precisely the same words into writing. There is really no occasion for this. Neither a polished literary style, nor even faultless spelling, is necessary for the communication of important facts. No matter how defective one's school education may be, if he has *something to say*, if his ideas are mentally wrought out and thought out, he can hardly go amiss in giving them utterance, orally or otherwise. For his thinking has been done in language, and the natural and unforced expression of what he means must be nearly or quite as clear as his thinking. But if he gets upon stilts, and tries to assume an artificial style quite foreign to that he is accustomed to use, ten to one he will fail to make himself understood. We trust no correspondent or reader of this journal will hesitate to communicate any thing he may deem of value to us or to the public, for fear of errors in style or grammar. Let his aim be to express his ideas clearly, and we will be responsible for the rest.

DIRECTORS' CARS.

A good many cars of this class have been built from time to time, for the special use of railway directors and other officers. Some of them are very costly and luxurious in finish and workmanship, and in most cases, perhaps, are designed as much for show cars to exhibit the skill and enterprise of the builders as for the accommodation of the officials who ride in them. This is all very well when a road is earning a fair surplus after paying interest and dividends, keeping road-bed and rolling stock in good condition, and with no material increase of floating indebtedness. If the managers choose to invest a few thousands in palatial finery for their own enjoyment they have a perfect right to do so, although it may cause censorious comment, and drive other and less prosperous roads to imitate their example rather than be outdone.

When one of these marvels of paint, carving, upholstery, miniature kitchens, electric call-bells, etc., is completed and ready for inspection, it is usual to notify the local newspaper reporters, and open a few baskets of champagne. The splendors of the vehicle are duly chronicled, but in such loose, vague and general terms, that car-builders who

desire information upon the technical points of construction must be content with the assurance that it is superior in elegance and beauty to anything ever turned out of a car shop. The cost of the vehicle is usually set down at such a high figure that plain people wonder how a structure of such small dimensions, as compared with a house of the same cost, could possibly absorb so much money. These high-wrought descriptions, dashed off by the local itemizer, so as to be in time for the early edition and head off the rival sheet round the corner, go the rounds of the press, inspire everybody with exalted notions of railroad extravagance, and at the same time widely advertise the enterprising builders, especially if they happen to be the proprietors of a contract shop.

A recent instance has so forcibly illustrated what we have said, that our remarks will hardly be deemed out of place. According to the news, papers, the Ohio Falls Car Co., at Jeffersonville, Ind., completed, a few weeks ago, a gorgeous directors' car for the Minneapolis & St. Louis Railroad, the cost of which has been estimated at \$25,000 and upward. It so much surpassed in magnificence any other car of its class ever built that its use is said to have been tendered to the President elect to carry him to Washington. This, however, turns out to be a great exaggeration. The president of the road denies that the car has been tendered for any such purpose, and, furthermore, that no such car as described has been ordered or bought by the road; but that a comfortable directors' car was built for it last summer, at a cost of \$9,000, and is now in use. How to reconcile these conflicting statements, and at the same time preserve the identity of the car, is somewhat difficult. The road officers are either unwilling to father such a costly affair, together with the newspaper notoriety it has attained, or else the reporters, in their eagerness to blazon the performance, have spread on the sugar rather thick; so much so, indeed, as to bring themselves into temporary discredit.

As it is one of the special functions of the CAR-BUILDER to notice and record newly invented railroad appliances, we take pleasure in announcing, on the authority of a paragraph in a contemporary journal, that Mr. Eugene Delira, Jr., of Beckmantown, Clinton County, N. Y., has invented a new car-coupler, which is simple, cheap, easily operated, and relieves train men from the necessity of going between the cars. The patent, it is said, will be issued in a couple of weeks. If all this is true, the inventor is to be congratulated not only upon his success in devising a coupler so exceedingly meritorious, but in avoiding all infringement upon the 2,000 patents, more or less, already issued for this class of railway appliances. We can assure him that there is a wide opening between the freight cars of the country for this product of his ingenuity.

It is enough to make railroad travelers in this country shiver, to read of the foot-warming contrivances to keep people comfortable on English trains. These "foot-warmers" are little tanks holding a gallon or two of warm water, the water being renewed or reheated when it gets cold. Fancy a traveler on the Pennsylvania railroad shouting every hour or so for more hot water, and getting a tardy supply of it, and tepid at that. Such a state of things would breed a mutiny and disgrace the company that could thus mock at the misery of its unhappy patrons. And yet this warm water arrangement for heating railway carriages has been in use in England for thirty years. It is the standard, regulation method, hallowed by tradition, and all the more precious for its antiquity. Neither the road managers nor people

IN CONNECTICUT.

road Commissioners give
the results of the ex-
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rma, of New Haven, 28
re or less color-blind. The
the matching of colored

appear to have any idea of dispensing with it. Coal stoves are, of course, not to be thought of; but if the tank water could be kept hotter, and renewed often, passengers would be quite satisfied, so habituated are they to this peculiar method, which has at least one advantage over coal stoves. If there is a violent smash-up, the tepid water will not set the car on fire nor scald the passengers to death.

A VERY superior anti-friction metal for journal bearings is being extensively introduced by the Granular Metal Co., of Boston, Mass. It does not heat by friction (being absolutely non-frictional), will not press out, nor cut the journals, nor wear endways, like other bearing metals. It flows as smoothly as oil, outwearing first-class Babbitt metal five to one, and standing the severest tests of pressure and speed. The Boston, Revere Beach & Lynn R. R. have run a set of journal boxes containing this metal, wearing out two sets of wheels, while the boxes were still in use. On the New York & New England road a comparative test, extending over seven months, during which 21,000 miles were run, showed a depreciation of only seven ounces per box to twelve ounces in the Babbitt metal boxes, or five ounces in favor of the granular metal, while there was no perceptible wear in the size of the journals. Other very favorable testimonials have been received by the company, and it now has contracts to supply many of the most important railroads, etc. The office of the company is at 22 Exchange Place, Boston.

THE American Humane Association's cattle car competition is assuming formidable proportions. The judges' circular No. 2 acknowledges the receipt of 420 models and about 200 plans and sketches, aside from a number of others at the express offices upon which charges have not been prepaid. These are to be compared with 111 stock-car patents already issued, and the prospect is that several months will elapse before the competitive examination will begin. Meantime, the competitors and the suffering cattle must have patience.

The Baldwin Locomotive Works' Illustrated Catalogue.—We have received a copy of this elegantly bound and beautifully illustrated volume. The first 53 pages are occupied with a detailed history of these celebrated works, embracing a period of nearly half a century of existence and continuous operation, and recounting the progressive improvements in locomotive construction with which the works are identified, and their steady growth from their early origin to their present capacity for turning out ten locomotives a week. The body of the catalogue contains a large number of fine photographic and sectional views of the different classes of locomotives, with full details of dimensions, weight, tractive power and performance, the arrangement being such as to illustrate a system of standards, embracing designs suited to all the requirements of ordinary service. For railroad men and others who are interested in locomotive construction and performance, or in a record of the amazing progress made in this department of mechanical industry, the catalogue is exceedingly valuable and attractive.

AN Erie, Pa., paper says that a brakeman was recently caught between the bumpers of two freight cars, and so horribly squeezed that no hopes of his recovery were entertained. He has, however, partly recovered, and is likely to get well. His head, once round, was pressed out by the accident, long and slim, and he is also from one-half to three-quarters of an inch taller. The terrible squeeze has made him cross-eyed, but his mind is as bright and clear as ever.

Railroad Salaries Thirty Years Ago.

The annual report of the Concord (N. H.) Railroad contains a list of all the tools then owned by the corporation, a schedule of the furniture in the stations on its line, and every other article that went to make up the assets; also a complete roll of the employees of the road from superintendent down to woodsmen, and the wages paid to each. Isaac Spaulding was President, with a salary of \$1,000; Hon. N. G. Upton, the Superintendent, received \$2,000; the Chief Clerk got \$800, and the assistant, Henry McFarland, now Treasurer of the Union Pacific at \$5,000 a year, \$340; Geo. Clough was a conductor and received \$50 per month, which was the amount paid to the station agent at Nashua; passenger engineers had \$2.25 a day, and freight train drivers, \$2; brakemen and firemen, \$1.25, and woodsmen and section men, \$1. Hon. John Kimball had charge of the repair shops in Concord, and was paid \$3.19 per diem. One of his workmen was a brother, Benjamin A. Kimball, at present a director of the corporation, whose salary was \$6 a week. Ex-Governor Weston, of Manchester, was the engineer of the road and received \$1,000, while the ticket agents of that place and Concord were each paid \$800 a year.

A TRAIN having run into a snow-drift on the Delaware River Railroad, a few days ago, the President sent this dispatch to the conductor: "Use all the fence rails you can lay your hands on if your coal gives out; throw in a barn or two if necessary, and if that fails you, take all the pork offered at \$6 per hundred. Keep your steam up and come through at any cost." The conductor and engineer obeyed instructions, reaching Woodbury about 10 P. M., where a corpse and funeral cortege from Philadelphia, with a number of passengers, had been awaiting it in the depot since five o'clock, the hour for its return trip.

HE was a fine looking man, and he proudly strutted down the sidewalk in front of the Windsor with the air of proprietorship in every movement. "Beg pardon, sir," said Frank Duffy, as he stepped up to him, hat in hand, in utmost humility, "do I have your permission to remain in the city over night?"

Our Directory.

We note the following changes since our last issue. Readers are requested to give us prompt notice of changes when they occur:

Alabama Great Southern.—Mr. Charles B. Wallace has been appointed Superintendent.

Burlington, Cedar Rapids & Northern.—Mr. Theodore Stickney has been appointed Purchasing Agent. He has been for some time chief clerk of the locomotive department.

Chicago & Alton.—Mr. J. T. Todd has been appointed Division Master Mechanic of the Kansas City & St. Louis divisions, in place of Mr. J. C. Munro, who is going to Mexico.

Chicago, Milwaukee & St. Paul.—Mr. Geo. E. Merchant, Superintendent of Sioux City & Dakota Division, has resigned to accept the position of General Manager of the Rochester & State Line road, vice Jas. E. Childs.

Delaware, Lackawanna & Western.—Mr. G. W. Oakman has resigned as Superintendent of the Utica Division, and it is said that Mr. F. J. Griffith, Assistant Superintendent of the Morris & Essex Division, will be his successor.

Kentucky Central.—Mr. J. D. Ellison has been appointed General Manager. He has heretofore been Superintendent of the Little Miami Division of the Pittsburg, Cincinnati & St. Louis.

Lake Shore & Michigan Southern.—Mr. Joseph S. Graham has been appointed Master Mechanic of the Buffalo Division. He has heretofore been foreman of the shops at Elkhart, Ind.

Mexican National.—Mr. J. C. Munro has been appointed General Master Mechanic, and will have his headquarters at the city of Mexico. He has for some time been Master Mechanic of the Kansas City & St. Louis Division of the Chicago & Alton.

New Orleans & Selma.—The officers of this road now

are: John Tucker, Trustee in possession; L. B. Schofield, Superintendent.

New York, Ontario & Western.—Mr. James E. Childs has been appointed General Superintendent, a new office on this road. He has been for several years Engineer and Superintendent of the Rochester & State Line Road.

Old Colony.—Mr. Richard W. Husted has been appointed Purchasing Agent, in place of Mr. F. P. Mosley, deceased.

Pittsburg, Cincinnati & St. Louis.—Mr. C. C. Waite, heretofore Superintendent of the Cincinnati & Muncie Valley Division, succeeds Mr. J. D. Ellison as Superintendent of the Little Miami Division.

Shepaug.—Mr. Edwin McNeill has been appointed Superintendent in place of Mr. C. H. Platt, resigned.

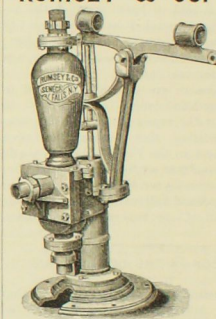
Southeastern, of Canada.—Mr. A. G. Eastman is appointed Master Mechanic, in place of E. C. Cross, resigned. Mr. Eastman was formerly on the Canada Central.

Toledo, Delphos & Burlington.—Mr. W. T. Brownson has been appointed Superintendent in place of Mr. L. S. Burgoon, resigned.

Worcester & Nashua.—Mr. G. W. Hurlburt has been appointed Superintendent in place of Mr. C. S. Turner, who has been chosen President and General Manager.

WANTED.—By a man who has had sixteen years experience, a situation as Superintendent of Machinery, or Superintendent of Machinery and Rolling Stock. Is also familiar with the details of Iron and Brass Founding. Address NATIONAL CAR BUILDER, 5 Day Street, New York.

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CONTINUOUS DRAW-BAR PATENTS.

The following circular has been issued by the Secretary of the Western Railroad Association: CHICAGO, Sept. 9, 1880.

To the Members of the Association: GENTLEMEN: Claims have been pending for several years that the Continuous Draw-Bar sold by the Continuous Draw-Bar Company under the Middleton and the Griffith and Paterson patents is an infringement of patent 71,580, granted 3d December, 1867 (reissue No. 8,065, granted 10th February, 1878), to Edward L. Caum.

This Association has continuously advised against entering this claim, but to quiet all questions, and at our instigation, the Continuous Draw-Bar Company has recently purchased the Caum pat. at its owners inserting in the assignment a full and absolute release to all the members of the Eastern and Western Railroad Associations from any and all liability for, or on account of, any infringement heretofore of said patent.

Yours truly,

J. H. RAYMOND, Secretary, etc.

PAINTS AND CO.

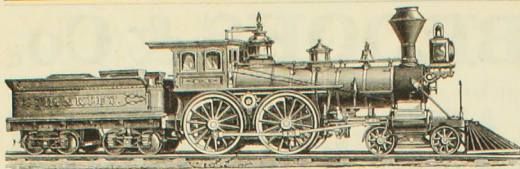
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PRICES AND PHOTOGRAPHS ON APPLICATION.



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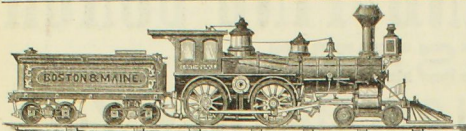
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This Company, having been reorganized, is prepared to receive orders for Locomotive Engines and Tenders, Boilers and Tanks, and to execute such orders promptly at fair prices for the best work.

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GREELY S. CURTIS, Treasurer.

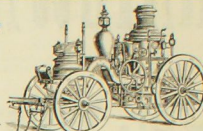


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LOCOMOTIVES

AND THE
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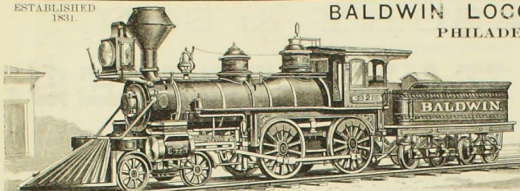
JOHN A. BURNHAM, President.
WM. G. MEANS, Treas., Boston, Mass.
ARETAS BLOOD, Agent, Manchester, N. H.



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Annual
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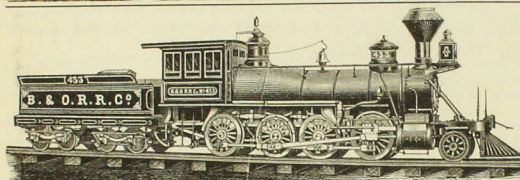
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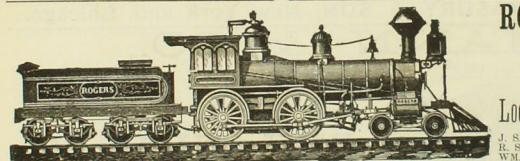
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JOHN COOKE, President, } PATERSON, N. J. } WM. BEEDAN, Sec. & Treas.
J. T. BLAUVELT, Vice-Pres. } JAMES COOKE, Supt.



ROGERS LOCOMOTIVE & MACHINE WORKS,

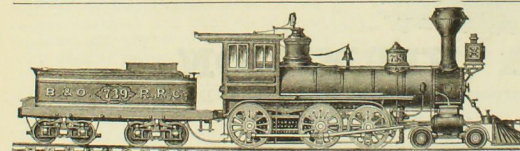
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New York Office, 44 Exchange Place.

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R. S. HUGHES, Secretary, } WM. S. HUDSON, Supt. } 44 Exchange Place, New York.



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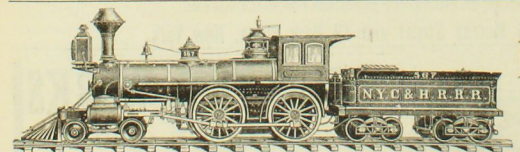
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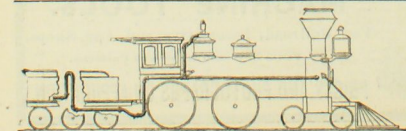
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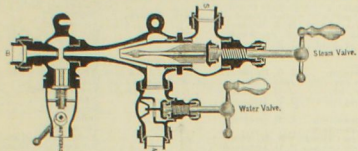
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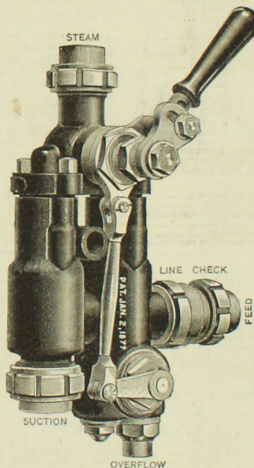
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Albany & Susquehanna	C. A. Jones	J. R. Skinner	Oneonta, N. Y.
Albany & Susquehanna	W. H. Johnson	W. H. Johnson	Albany, N. Y.
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Atchison, Topeka & Santa Fe	C. Hackney	St. Louis, Mo.
Atchison, Topeka & Santa Fe	C. Hackney	Topeka, Kan.
Atchison, Topeka & Santa Fe	Atchison, Mo.
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Baltimore & Ohio	Sam. Houston	Sam. Houston	Piedmont, Va.
Baltimore & Ohio	E. L. Wegsberger	E. L. Wegsberger	Grafton, W. Va.
Baltimore & Ohio	Chas. H. Maxwell	Chas. H. Maxwell	Cumtoga, Md.
Baltimore & Ohio	Chas. Hirsch	Chas. Hirsch	Wheeling, W. Va.
Baltimore & Ohio	Wm. C. Crawford	Wm. C. Crawford	Wheeling, W. Va.
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Chicago Division	G. W. Johnson	G. W. Johnson	Garrett, Ind.
Chicago Division	Geo. Wilson	Geo. Wilson	Chicago, Ill.
Pittsburg Division	Wm. C. Samuel	Wm. C. Samuel	Kingston, Ill.
Baltimore & Potomac	W. R. H. Soule	W. R. H. Soule	Connellsville, Pa.
Bath & Hammond'sport	Allen Wood	Allen Wood	Hammond's P. N. Y.
Bedford, Springfield & Bloom's	Wm. C. Elliott	Wm. C. Elliott	Bedford, Pa.
Bellefonte & Snow Shoe	H. D. Landis	H. D. Landis	Bellefonte, Pa.
Boston & Albany	Wm. C. H. Churchard	Wm. C. H. Churchard	Springfield, Mass.
Boston & Albany	A. B. Underhill	J. B. Weston	Springfield, Mass.
Boston & Albany	T. B. Purvis	J. F. Adams	Greenbush, N. Y.
Boston & Albany	George Richards	J. J. Doran	Albany, N. Y.
Boston & Providence	Chas. F. Brigham	Chas. F. Brigham	Boston, Mass.
Boston, Barre & Gardner	Wm. C. H. Churchard	D. L. Pickering	Worcester, Mass.
Boston & Montreal	Wm. Smith	Wm. Smith	Boston, Mass.
Boston & Maine	C. C. Richardson	C. C. Richardson	Lawrence, Mass.
Boston & Lowell	J. F. Crockett	J. F. Crockett	New Haven, Conn.
Boston & New York Air-Line	J. L. Frolick	John Coghlan	New Haven, Conn.
Beverly, Andover & Lowell	W. E. Cooper, Jr.	W. E. Cooper, Jr.	Bradford, Pa.
Bradford, Bordell & Kinzua	D. H. Wawker	D. H. Wawker	Bradford, Pa.
Burlington & Missouri River in Neb.	D. H. Wawker	D. H. Wawker	Plattsburgh, Neb.
Burlington, Cedar Rapids & Nor.	R. W. Bushnell	R. W. Bushnell	Cedar Rapids, Ia.
Burlington & Southwestern	J. G. Hubbard	J. G. Hubbard	Plattsburgh, N. Y.
Buffalo & Southwestern	H. B. Allen	H. B. Allen	Buffalo, N. Y.

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Dak. So. & Sioux City & Pembina	J. H. Moulton	J. H. Moulton	Yankton, Dak.
Dak. & North Western	B. L. Baldwin	N. M. George	Yankton, Dak.
Dayton, Olney & Ohio River	L. H. Parson		Danville, Ill.
Dayton & Springfield	H. S. Gordon		Kansas, Ill.
Dayton & Union	H. S. Gordon	H. S. Gordon	Dayton, O.
Dayton & South Western	John Black		Dayton, O.
Dayton & Michigan	John Black		Lima, O.
Delaware, Lackawanna & West.	Walter Dawson	Robert McKenna	Scranton, Pa.
Delaware & Chesapeake	J. H. Barker		Scranton, Pa.
Morris & Essex Division	J. W. Baker		Dover, N. J.
Des Moines & Grand Rapids	James Buchanan		Dover, N. Y.
Utica, Chenango & Susq. Div.	Thos. Thatcher		Utica, N. Y.
Bloomsburg Division	Charles Graham		Utica, N. Y.
Delaware & Chesapeake	J. H. Barker		Easton, Md.
Delaware & Hudson Canal Co.	R. C. Blackburn		Albany, N. Y.
Delaware & Potomac	T. Orchard		Albany, N. Y.
Rensselaer & Saratoga Div.	Chas. Körner		Green Island, N. Y.
Denver Pacific	J. J. McCony	John Clark	Denver, Colo.
Denver & Rio Grande	W. Sample	W. Sample	Denver, Colo.
Des Moines & Fort Dodge	John McGraw	E. A. Avery	Grand Junction, La.
Detroit & Bay City	R. C. Watson		Grand Rapids, Mich.
Detroit, Grand Haven & Mil.	Fred Parker		Detroit, Mich.
Detroit, Lansing & Northern	R. C. Watson		Detroit, Mich.
Dunkirk & Allegheny	J. C. Hackett		Cambria, Pa.
Dunkirk, Allegheny Val. & Pitts	J. C. Hackett		Dunkirk, N. Y.
East Boston Top.	Wm. C. Maynes		Orholfson, Pa.
Eastern	J. D. Billings		Salem, Mass.
Eastern	S. P. Wallis		East Boston, Mass.
Eastern Kentucky	D. L. Weaver		Horton, Ky.
Exeter, Portsmouth & Georgia	Joseph Armstrong		Exeter, N. H.
Exie & Pittsburg	J. N. Wood	J. N. Wood	Exie, Pa.
Exie & Tallahassee	A. Bailey		Exie, Pa.
European & North Am. (of Maine)	A. Bailey		Mattawamkeuc, Me.
Evansville & Terre Haute	John L. White	Joseph Stuker	Evansville, Ind.
Fitchburg	W. Geo. A. Coddle	J. W. Marden	Charlottesville, Mass.
Fitchburg & Portland & Mass. Div.	J. T. Hartsell	J. T. Hartsell	Fitchburg, Mass.
Fitch & Pere Marquette	J. T. Hartsell	J. T. Hartsell	Fitchburg, Mass.
Florida Central	James S. McElroy	James S. McElroy	Fort Payne, Ala.
Florida, North Shore & Central	W. Hollister	Edward Riley	Fort Payne, Ala.
Fort Wayne & Jackson	W. Hollister		Fort Wayne, Ind.
Fort Wayne & Cincinnati	Wm. McPhail		Fort Wayne, Ind.

Gale, Harrisburg & San Antonio	J. D. T. Davis	Jas. Alexander	Harrisburg, Tex.
Galveston, Houston & Henderson	J. D. Conover	Geo. W. Vawter	Galveston, Tex.
Gall, Galveston, Houston & San Antonio	John S. Cook	T. M. Prevail	Galveston, Tex.
Georgia	A. S. Parker	Hugh Smith	Augusta, Ga.
Grand Haven	Herbert Wallis	Wm. McWood	Grand Haven, Mich.
Grand Rapids & Canton	Wm. Noyes	Duncan Menish	Montreal, Canada
Grand Rapids & Sable	J. M. Beon	J. R. Fish	Portland, Me.
Grand Rapids & Indiana	J. B. Hory	J. R. Fish	Grand Rapids, Ind.
Grayville & Mattoon	C. F. Hanson	Henry Childs	Hamilton, Can.
Great West, Grand Rapids & Mattoon	C. F. Hanson	Henry Childs	London, Ont.
Great Western, of Canada	Geo. B. Nicols	W. H. Martin	London, Ont.
Gulf, Colorado & Santa Fe	J. H. Bingley	John J. Bingley	Galveston, Tex.
Hanover Junction & Gettysburg	*Thos. G. Gorman	Thos. G. Gorman	Hanover, Pa.
Hannibal & St. Joseph	John J. Bingley	John J. Bingley	Hannibal, Mo.
Havana, Rantoul & Eastern	N. Singland	J. J. Ferris	St. Louis, Mo.
Houston & Texas	E. J. Wiggin	James McGee	Falls Village, Conn.
Houston, East & West Texas	Wm. Barkia		Houston, Tex.
Houston & Texas			Saxton, Pa.
Huntingdon & Broad Top			
Illinois Central	*S. J. Hayes	W. B. Snow	Chicago, Ill.
Chicago Division	Henry DeLoach		Chicago, Ill.
South Division	David Oxley		Centralia, Ill.
North Division	J. R. Edman		Amboy, Ill.
Iowa Division	Thomas W. Place		Waterloo, Ia.
Springfield Division	W. B. McKenna		Clinton, Ill.
Illinois & St. Louis	J. H. Smith		Paris, Ill.
			Belleville, Ill.

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Railroad.	Master-Mechanic.	Master Car-Builder.	Residence.	Railroad.	Master-Mechanic.	Master Car-Builder.	Residence.
Hillman & St. Louis		Charles Rother	E. St. Louis, Ill.	New York, Penn. & Ohio	N. Wright	W. G. Huggard	Cleveland, C.
Indianapolis & Decatur Springs		Paulski Leeds	Indianapolis, Ind.	New York, Penn. & Ohio	S. V. Smith	J. T. Fodick	Kent, O.
Indianapolis & Chicago		John McKenna	Indianapolis, Ind.	New York, Penn. & Ohio	William Hill	S. V. Holmes	Salamanca, N. Y.
Indianapolis & St. Louis		A. J. Sanborn	Indianapolis, Ind.	New York, Penn. & Ohio	J. T. Fodick	J. T. Fodick	Providence, R. I.
Indianapolis & Springfield		John McKenna	Indianapolis, Ind.	New York, Penn. & Ohio	J. H. Anderson	J. H. Anderson	Baltimore, Md.
International & Great Northern		R. H. Johnson	Indianapolis, Ind.	New York, Providence & Boston	J. M. Coale	J. W. Demarest	Elmira, N. Y.
Intercolonial		H. A. Whitney	Indianapolis, Ind.	Northern Central	J. M. Coale	J. C. Dwyer	Toronto, Can.
Long Island		Henry Scott	Indianapolis, Ind.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Jacksonville, Pensacola & Mobile		Jas. D. Hollister	Tallahassee, Fla.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Jeffersonville & Indianapolis		Edw. Austin	Indianapolis, Ind.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Jacksonville, N. West & S. East		B. J. Miller	Jacksonville, Ill.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Joplin		P. T. Buttery	Joplin, Mo.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Kansas City & Breakwater		P. T. Buttery	Kansas City, Mo.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Kansas City, Fort Scott & Gulf		J. S. McCrum	Kansas City, Mo.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Kansas City, Lawrence & South		J. S. McCrum	Kansas City, Mo.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Kansas City, St. J. & C. & B. R.		Wm. McCall	Kansas City, Mo.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Kansas Central		Wm. McCall	Kansas City, Mo.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Kansas City & Lawrence		Wm. McCall	Kansas City, Mo.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Kaw Valley Division		James Long	Kaw Valley, Mo.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Keokuk Valley Division		James Long	Keokuk, Ia.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Kentucky Central		James Long	Kentucky, Ky.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Knox & Lincoln		James Long	Knox, Mo.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
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Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa.	Northern Central	J. M. Coale	J. C. Dwyer	Providence, R. I.
Lake Erie & Western		James Long	Lake Erie, Pa				

Railroad.		Master Mechanic.	Master Car Builder.	Residence.
Spartanburg, Union & Columbia		Wm. Platt	W. B. Brown	Spartanburg, S. C.
Spartanburg & Asheville		M. Fraser	W. B. Brown	Spartanburg, S. C.
Springfield, Alford & Northeastern		W. E. Lessor		Springfield, Mass.
Springfield Southern		F. W. Johnston		Springfield, Mass.
State Line & Sullivan		J. O. Hays		Towanda, Pa.
Stockton & Opperopolis		John M. Fulton		Stockton, Cal.
St. Croix & Penobscot		G. H. Cosen	H. C. Tucker	Milltown, Me.
St. Johns		F. A. Orons		St. Augustine, Fla.
St. John & Lake Champlain		Geo. E. Howe		St. Joseph, Vt.
St. Joseph & Des Moines		F. A. Orons		St. Joseph, Mo.
St. Joseph & Western		E. Sleepy	E. Sleepy	St. Joseph, Mo.
St. Lawrence & Ottawa		Calvin Dams	Calvin Dams	Prescott, Canada
St. Louis Iron Mount & So.		O. A. Haynes	Oscar Doolittle	St. Louis, Mo.
Arkansas Division		I. Finlay	I. Finlay	Little Rock, Ark.
Missouri Division		W. H. Harris	H. M. Adrich	De Soto, Mo.
St. Louis, Alton & Terre Haute		Beriah Warren		St. Louis, Mo.
St. Louis & San Francisco		Thomas Everson	A. W. Grossvorn	N. Springfield, Mo.
St. Louis, Keokuk & Northwest		Wm. Foley		Keokuk, Iowa
St. Louis Bridge Co. & Tunnel R.R.		H. W. Smith		St. Louis, Mo.
St. Paul & Duluth		W. McFarland	John Hill	St. Paul, Minn.
St. Paul, Minneapolis & Manitoba		A. Ackery		St. Paul, Minn.
St. Paul & Sioux City		Matt Ellis		Shakopee, Minn.
Sussex		E. H. Osborn	R. L. Sutton	Newton, N. J.
Syracuse, Binghamton & N. Y.		James Buchanan	James Buchanan	Syracuse, N. Y.
Syracuse, Chenango & New York		Geo. W. West		Syracuse, N. Y.
Tennessee & Pacific		William McKeand	William McKeand	Nashville, Tenn.
H. & Indiana Pools		H. C. Peddie	E. D. Carter	Terre Haute, Ind.
Indiana Pools & Vandalia		Chas. Butler		Indianapolis, Ind.
Logansport Division		A. J. Prescott	H. L. Clark	Logansport, Ind.
Texas & New Orleans		H. J. Small	I. F. M. Alexander	Houston, Texas
Texas & Pacific		Pers. Benny	D. H. Stratton	Dallas, Texas
Toledo, Delphos & Burlington		F. M. Mast		Delphos, O.
Toronto, Grey & Bruce		J. Haggas	Torvaldson	Toronto, Can.
Toronto & Nipissing		Z. B. Davis	R. V. Coon	Troy, N. Y.
Troy & Boston				
Utster & Delaware		J. B. Driskman	Jno. H. Decker	Rondout, N. Y.

Directory of Railway Superintendents and Purchasing Agents THROUGHOUT THE UNITED STATES AND CANADA.

REFERENCES: * General Manager. † General Superintendent. ‡ Assistant General Superintendent. § Assistant General Manager.

Railroad.		Superintendent.	Purchasing Agent.	Residence.
Adirondack		C. E. Durkee		Saratoga, N. Y.
Alabama Central		John M. Bridges		Selma, Ala.
Alabama Great Southern		John Scott	R. W. Healey	Chattanooga, Tenn.
Alabama Great Southern		G. M. Serpell		Chattanooga, Tenn.
Albany & Susquehanna		C. F. Young		Honesdale, Pa.
Allegheny Valley		David McCargo	David McCargo	Pittsburg, Pa.
Anderson, Lebanon & St. Louis		Jas. C. Larnard		Anderson, Ind.
Arkansas Midland		A. H. Johnson		Helena, Ark.
Ashtabula & Pittsburgh		W. B. Strong	F. M. Smith	Ashtabula, O.
Atchison, Topeka & Santa Fe		A. A. Robinson		Las Vegas, N. M.
Eastern Division		D. C. Chase		Chicago, Ill.
Atlanta & Charlotte Air Line		G. J. Foreacre	G. J. Foreacre	Atlanta, Ga.
Atlanta & West Point		P. T. Grant		Atlanta, Ga.
Atlantic & North Carolina		A. B. Andrews		Newbern, N. C.
Atlantic & Pacific		F. W. Smith		Albuquerque, N. M.
Atlantic, Mississippi & Ohio		Geo. Hoffman	J. P. Minette	Charlotte, N. C.
Atlantic, Tennessee & Ohio		J. J. Gormley		Charlotte, N. C.
Baltimore & Ohio		W. M. Clements	N. S. Hill	Baltimore, Md.
Ohio & Chicago Division		C. H. Hudson		Chicago, Ill.
Pittsburg Division		G. M. Serpell		Conneville, Pa.
Baltimore & Potomac		Geo. C. Wilkins	A. W. Sumner	Baltimore, Md.
Baltimore & Pocomoke		Arthur Brown		Baltimore, Md.
Baltimore & Annapolis		M. H. Hall		Hamm dep. N. Y.
Bedford, Spiveille, Owensburg & B.		W. S. Kennedy	Jas. W. Kennedy	Bedford, Ind.
Belleville & Snow Shoe		Daniel Rhoads		Belleville, Pa.
Belleville & Snow Shoe		Robert G. Ford		Belleville, Pa.
Belleville & Snow Shoe		F. D. White	F. C. White	Belleville, Pa.
Blairsville		E. H. Whorf		Blairsville, N. J.
Boston, Revere Beach & Lynn		Wm. Bliss		Boston, Mass.
Boston & Albany		C. O. Russell		Boston, Mass.
Boston & Providence		Jos. H. Franklin		New Haven, Conn.
Boston & Concord & Montreal		A. A. Folsom	A. A. Folsom	Boston, Mass.
Boston & Concord & Montreal		J. A. Dodge	J. Thomas Vose	Plymouth, N. H.
Boston, Concord & Montreal		J. W. A. Stowell		Mechanicsville, N. Y.
Boston, Housatonic & Western		B. B. Burnham		Boston, Mass.
Boston & Maine		J. T. Furber	J. T. Furber	Boston, Mass.
Boston & Lowell		A. A. Hobart	F. H. Nourse	Boston, Mass.
Boston, Barre & Gardner		H. M. Witter	H. M. Witter	Worcester, Mass.
Bradford, Bortell & Kinna		B. C. Williams		Bradford, Pa.
Brooklyn, Flatbush & Coney Isl.		W. D. Meader		Brooklyn, N. Y.
Brunswick & Albany		P. A. E. Tozland	G. Hargreaves	Brunswick, Ga.
Burlington & Mo. River (in Neb.)		Geo. W. Holdrege		Omaha, Neb.
Burlington & Mo. River (in Neb.)		J. O. Phillips		Omaha, Neb.
Burlington, Cedar Rapids & Nor.		C. J. Ives	Theo. Stickney	Cedar Rapids, Ia.
Burlington & Northwestern		John F. Gerry	John F. Gerry	Burlington, Ia.
Burlington & Southwestern		J. W. Smith		Burlington, Ia.
Buffalo & Southwestern		John F. Gerry		Buffalo, N. Y.
Buffalo, New York & Philadelphia		Geo. S. G. Hall	J. H. Pools	Buffalo, N. Y.
Cairo & St. Louis		Chas. Hamilton	Chas. Hamilton	St. Louis, Mo.
Cairo & Vincennes		Roswell Miller	T. W. Fitch	Cairo, Ill.
California Pacific & Northern		J. A. Fillmore		Sacramento, Cal.
Camden & Atlantic		F. A. Lister	F. A. Lister	Camden, N. J.
Canada Central		Arthur Baker		Archer, Ont.
Canada Southern		Wm. P. Taylor		Buffalo, N. Y.
U. S. Division		E. P. Murray	A. F. Howland	St. Thomas, Ont.
Canada Division		W. E. Carroll		St. Thomas, Ont.
Canadian Pacific		J. F. Lynskey		Winnipeg, Man.
Carbondale & Shawneetown		R. J. Carvett		Carbondale, Ill.
Carrollton & Foggsville		C. H. Roberts	C. H. Roberts	Winnington, N. C.
Cayuga Southern		C. W. Chapman	C. W. Chapman	Winnington, N. C.
Cayuga & Susquehanna		W. R. Humphreys		Syrre, Pa.
Cazenovia, Canastota & De Ruyter		John Stebbins		Cazenovia, N. Y.
Central Pacific		J. A. Fillmore		San Francisco, Cal.
Central Pacific		J. R. Watson		Sacramento, Cal.
Western & Visalia Divisions		D. Wilder		Oakland, Cal.
Truckee Division		Frank Free		Wadsworth, Nev.

Railroad.		Master Mechanic.	Master Car Builder.	Residence.
Union Pacific		J. H. Congdon	Edo. F. Stevens	Omaha, Neb.
Eastern Division		A. M. Collett		Omaha, Neb.
Eastern Division		H. P. Mackey		Grand Island, Neb.
Mountain Division		T. A. Davis	John E. Davis	Cheyenne, W. T.
Laramie Division		Floyd Weaver		Laramie, W. T.
Western Division		R. V. Brinkley		Keaton, W. T.
Colorado Division		E. G. Thomas		Golden, Col.
Denver & Pacific Div.		James S. Scott		Denver, Colo.
Kansas Division		**John Mackenzie	J. B. Roberts	Kansas City, Mo.
Kansas Division		J. B. Daily		Ellis, Kan.
Utah Central		W. B. Armstrong	Sam. S. Tucker	Salt Lake City, U.
Utah Western		Robert Anderson		Utah, U. T.
Utica & Black River		John Bailey	David James	Breesport, N. Y.
Utica, Rhaca & Elmira		Geo. W. Cleveland	F. W. Magargil	Breesport, N. Y.
Valley		Amos Pillsbury	Chas. Blanchard	Cleveland, O.
Vicksburg & Meridian		Jas. B. Browne		Vicksburg, Miss.
Vicksburg, Shreveport & Pacific		W. Bell Smith	W. Bell Smith	Monroe, La.
Virginia & Truckee		I. N. Fording		Carson, Nev.
Virginia Midland		J. E. Wadley	J. T. Nallo	Alexandria, Va.
Wabash, St. Louis & Pacific		Chauncey R. Morris		Fort Wayne, Ind.
Wabash, St. Louis & Pacific		Jacob Johann	B. B. Rose	Springfield, Ill.
Wabash, St. Louis & Pacific		W. O. Hewitt	R. M. Hemphill	Peoria, Ill.
Wabash, St. Louis & Pacific		U. H. Kohler		Toledo, Ohio.
Wabash, St. Louis & Pacific		J. S. Hock		Stansbury, Mo.
Wabash, St. Louis & Pacific		John Dikeman	C. S. Hick	Stansbury, Mo.
Washington & Ohio		Edw. Dunn	John H. Decker	Rondout, N. Y.
Welland		James Taylor	Wm. H. Pay	St. Catharines, C.W.
Western & Philadelphia		J. D. Danfield	S. D. Danfield	Chester, Pa.
Western & Atlantic		H. C. Ryan		Atlanta, Ga.
Western Maryland		David Holtz	J. H. Nussner	Union Bridge, Md.
Western Union		Robert King	F. M. Wade	Montgomery, Ala.
Western Union		Isaac W. Clark	Isaac W. Clark	Fayetteville, N. C.
West Feliciana		John Taylor		Bacine, Wis.
White Water		A. J. Tilton	Wm. McKelvey	Laurel Hill, La.
Whitewater		Wm. Bisset		Harrison, O.
Winnington & Welden		Wm. H. Day		Florence, S. C.
Wisconsin Central		John Bisset	Wm. H. Day	Winnington, N. C.
Wisconsin Central		A. Tenwick	C. R. Clowe	Stevens Pt., Wis.
Worcester & Nashua		T. B. Snowden	L. A. Adam	Worcester, Mass.
Worcester & Nashua		John G. Brady	John G. Brady	Worcester, Mass.

Railroad.	Superintendent.	Purchasing Agent.	Residence.
Humboldt Division	G. W. Coddington		Carlin, Nev.
Salt Lake Division	A. G. Felling		Ogden, Utah
Sacramento & Oregon Div.	R. G. Pratt		Sacramento, Cal.
Central Vermont	J. W. Hobart		St. Albans, Vt.
Central Vermont	J. M. Foss		St. Albans, Vt.
Northern Division	John Schrier		Adirondack, N. Y.
Northern Division	J. E. Futoos		St. Johns, P. Q.
Rutland Division	J. Burdett		St. Johns, P. Q.
New London Northern	G. W. Bentley	G. W. Bentley	New London, Conn.
Central of Iowa	Wm. Rogers	Henry Hogg	Savannah, Ga.
Atlanta Division	D. N. Pickering	D. N. Pickering	Marshalltown, Ia.
Central of Iowa	F. F. Schellman		Marshalltown, Ia.
Central Division	W. W. Stearns		Elizabeth, N. J.
Champaign, Havana & Western	A. H. Wood		Mauch Chunk, Pa.
Charlotte & Savannah	C. S. Gadsden	G. R. Talcott	Charlotte, S. C.
Charlotte, Columbia & Augusta	W. M. S. Dunn	A. A. Netherland	Richmond, Va.
Chesapeake & Ohio	J. F. M. Dunn		Richmond, Va.
Chesapeake & Ohio	John Postle		Richmond, Va.
Chesapeake & Ohio	H. Stewart	H. H. Stone	Richmond, Va.
Chicago & Northwestern	*Marvin Huchitt	R. W. Hamer	Chicago, Ill.
Chicago & Northwestern	C. S. Wheeler		Chicago, Ill.
Chicago & Northwestern	E. J. Cuyler		Chicago, Ill.
Chicago & Northwestern	G. R. Lindsay		Chicago, Ill.
Chicago & Northwestern	C. A. Sniford		Chicago, Ill.
Chicago & Northwestern	Chas. Murray		Chicago, Ill.
Chicago & Northwestern	Wm. S. Peter Division	S. Sanborn	Chicago, Ill.
Chicago & Northwestern	J. J. Nichols		Chicago, Ill.
Chicago & Northwestern	J. B. Trull		Chicago, Ill.
Chicago & Northwestern	J. C. McMillen	S. V. Hartwell	Chicago, Ill.
Chicago & Northwestern	C. H. Chapell		Bloomington, Ill.
Chicago & Northwestern	A. M. Richards		Chicago, Ill.
Chicago & Northwestern	O. Vaughan		Chicago, Ill.
Chicago & Northwestern	A. F. Beach		Chicago, Ill.
Chicago & Northwestern	Thos. J. Potter	Wm. Irving	Chicago, Ill.
Chicago & Northwestern	John D. Besler		Chicago, Ill.
Chicago & Northwestern	Chas. Ryder		Chicago, Ill.
Chicago & Northwestern	H. Richeock		Chicago, Ill.
Chicago & Northwestern	St. Louis & R. I. Div.	W. R. Crumpton	St. Louis, Mo.
Chicago & Northwestern	W. C. Perkins		Burlington, Iowa.
Chil., Clinton, Dubuque & Minn.	*F. O. Wyatt	F. O. Wyatt	Chicago, Ill.
Chicago & Eastern & Minn.	O. S. Lyford	O. S. Lyford	Chicago, Ill.
Chicago & Iowa	W. H. Holcomb	W. H. Holcomb	Chicago, Ill.
Chicago & Northwestern	J. M. Turner		Lansing, Mich.
Chicago & Pacific	J. M. Whitman	James Penny	Chicago, Ill.
Chicago & Paduach	D. H. Conklin		Chicago, Ill.
Chicago & Paduach	C. L. Rising		Chicago, Ill.
Chicago, St. Louis & New Orleans	*J. C. Clarke	J. C. Clarke	New Orleans, La.
Chicago, St. Louis & New Orleans	W. P. McKinley		McComb City, Miss.
Chicago, St. Louis & New Orleans	J. G. Mann		Jackson, Tenn.
Chicago, St. Louis & New Orleans	A. Kimball		Davenport, Iowa.
Chicago, Rock Island & Pacific	A. Manvel	A. Manvel	Chicago, Ill.
Southwestern Division	G. F. Walker		Trenton, Mo.
Iowa Division	H. F. Royce		Des Moines, Iowa.
Illinois Division	B. H. Chamberlin		Chicago, Ill.
Knoxville & New Orleans Div.	R. C. Mawler		Rocky Mt., S. C.
Chicago & West Michigan	G. M. Lawler		St. Joseph, Mich.
Chicago, Milwaukee & St. Paul	C. A. Van Horne	J. T. Crocker	Milwaukee, Wis.
Ch. & La Crosse & St. Paul Div.	L. B. Rock		Milwaukee, Wis.
Northern Division	L. B. Rock		Minneapolis, Minn.
Chicago & St. Paul	J. H. Lake		Wabasha, Minn.
Wabasha Division	J. H. Lake		Wabasha, Minn.
Western Union Division	D. A. Olm		Pacific, Wis.
Stout City & Dak. Div.	J. M. Egan	J. M. Egan	Soux City, Ia.
Southern Minnesota Div.	J. W. Fagan		La Crosse, Wis.
Chicago, Peoria & N. W. Div.	E. W. Winter	W. H. S. Wright	St. Paul, Minn.
Chicago, St. Paul & Minneapolis	Henry O'Connell		Batavia, N. Y.
Chicago & Grand Trunk	N. Wall		Fort Gratiot, Mich.
Chicago & Grand Trunk	L. Stanley		Chippewa Falls, Wis.
Chippewa Falls & Western	C. S. Wilber		Chippewa Falls, Wis.
Cincinnati & Western	*Norman Beckley	Norman Beckley	Erikstad, Ind.
Cincinnati & Western	Wm. H. Cram		Waco, Tex.
Cincinnati, Richmond & Chicago	*Lewis Williams		Cincinnati, O.
Cincinnati, Rock Pk. & Charleston	H. C. Brannan		Rock Pk., W. Va.
Cincinnati & Terre Haute	H. C. Brannan		Terre Haute, Ind.
Cin., Cumberland & Gap & Southwest	J. Taylor		Knoxville, Tenn.
Cincinnati, Hamilton & Dayton	Lewis Williams		Savannah, Ga.
Cin., Hamilton & Indianapolis	Lewis Williams	Frank Herring	Cincinnati, O.
Cin., Sandusky & Cleveland	Sam'l Woodward	Julius Uehlen	Cincinnati, O.

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Railroad.	Superintendent.	Purchasing Agent.	Residence.	Railroad.	Superintendent.	Purchasing Agent.	Residence.
Natchez, Jackson & Columbus.	J. H. Fitzpatrick.	Geo. W. Beach.	Waterbury, Conn.	Pine River Valley & Stevens Pt.	N. J. Chas. J. Stevens.	Richmond, Va.	Richmond, Va.
Naugatuck.	Geo. W. Beach.	Geo. W. Beach.	Waterbury, Conn.	Pittsburg & Castle Shannon.	A. G. Hays.	Pittsburg, Pa.	Pittsburg, Pa.
Nebraska.	Wm. Irving.	Wm. Irving.	Omaha, Neb.	Pittsburg & Lake Erie.	R. W. Jones.	Pittsburg, Pa.	Pittsburg, Pa.
Nevada Central.	Jos. Collett.	F. W. Dunn.	Battle Mountain.	Pittsburg, Cincinnati & St. Louis.	S. M. Felton, Jr.	William Mullins.	Pittsburg, Pa.
Newburg, Dutchess & Connecticut.	C. L. Kimball.	C. L. Kimball.	New.	Pittsburg, Cincinnati & St. Louis.	D. W. Caldwell.		Pittsburg, Pa.
New Brunswick & Canada.	John Stewart.	St. Stephen, N. Y.		Pittsburg, Cin. & St. Louis Div.	J. B. Harter.		Pittsburg, Pa.
New Brunswick.	E. B. Burpee.	T. Burpee.	Gibson, N. Y.	Col. Cin. & Ind. Cent. Div.	D. T. Bacon.		Logansport, Ind.
New Canaan.	Wm. St. John.		New Canaan, Conn.	Indianapolis & Vincennes Div.	E. W. McKenna.		Richmond, Ind.
New Castle & Franklin.	A. Vandort.		New Castle, Pa.	Cincinnati & Musk. Valley Div.	C. C. Waite.		Zanesville, O.
New Haven & Derby.	E. S. Quintart.		New Haven, Conn.	Little Miami Div.	C. C. Waite.		Cincinnati, O.
New Haven & Northampton.	C. N. Yeaman.	C. N. Yeaman.	New Haven, Conn.	Pittsburg, Ft. Wayne & Chicago.	C. J. Lantz.	William Mullins.	Pittsburg, Pa.
New Jersey & New York.	J. D. Hasbrouck.		Jersey City, N. J.	Pittsburg, Ft. Wayne & Chicago.	J. C. E. Gorman.		Pittsburg, Pa.
New Jersey Southern.	Rufus Bologgett.		Jersey City, N. J.	Eastern Division.	George S. Griscom.		Pittsburg, Pa.
New Orleans & Selma.	L. B. Scofield.		Selma, Ala.	Western Division.	C. D. Gorman.		Pittsburg, Pa.
New York Lake Erie & Western.	Robert Harris.		New York, N. Y.	Pittsburg, Titusville & Buffalo.	J. D. Bonner.		Pittsburg, Pa.
New York Lake Erie & Western.	E. S. Bowen.	J. A. Hardenbergh.	New York, N. Y.	Pittsburg, Virginia & Charleston.	J. M. Byers.	John L. Awi.	Pittsburg, Pa.
New York Lake Erie & Western.	E. O. Chamie.		New York, N. Y.	Port Dover & Lake Huron.	A. B. Atwater.		Woodstock, Ont.
New York Lake Erie & Western.	E. P. Wright.		New York, N. Y.	Port Royal & Augusta.	E. G. Fleming.		Augusta, Ga.
Eastern Division.	E. O. Hill.		Port Jervis, N. Y.	Portland & Ogdensburg.	Jonas Hamilton.	Jonas Hamilton.	Portland, Me.
Delaware Division.	Benj. Thomas.		Port Jervis, N. Y.	Portland & Rochester.	G. P. Wescott, Sec.	Charles Kennedy.	Portland, Me.
Susquehanna Division.	R. B. Cable.		Buffalo, N. Y.	Potomac, Frederick & Piedt.	Charles Kennedy.		Poughkeepsie, N. Y.
Buffalo & Rochester Div.	E. G. Taylor.		Buffalo, N. Y.	Poughkeepsie, Hartford & Boston.	J. A. Perkins.	A. W. Cable.	Poughkeepsie, N. Y.
Western Division.	J. S. Beegs.		Punkin, N. Y.	Prince Edward Island.	L. E. Archibald.	L. E. Archibald.	Charlottetown, P. E. I.
New York & Greenwood Lake.	Wm. P. Harris.		Jersey City, N. J.	Prospect Park & Coney Island.	R. Schermerhorn.		Coney Island, N. Y.
New York New Haven & Hartford.	E. M. Reed.	R. N. Dowd.	New York, N. Y.	Providence & Springfield.	William Tinkham.	William Tinkham.	Providence, R. I.
N. Y. & N. H. Division.	John T. Moody.		Hartford, Conn.	Providence & Worcester.	W. E. Chamberlain.		Providence, R. I.
Hartford Division.	C. S. Davidson.		New Haven, Conn.	Providence, Warren & Bristol.	Waterman Stone.		Providence, R. I.
Shore Line Division.	W. H. Stevenson.						
New York Central & Hudson Riv.	C. M. Toucey.	R. C. Moore.	New York, N. Y.				
Hudson River & Harlem Div.	S. C. T. Moore.		Utica, N. Y.				
Eastern Division.	Zenas C. Priest.		Rochester, N. Y.				
Western Division.	Geo. H. Burrows.		Alas. Tillamook.				
New York Central Division.	Chas. M. Russell.	R. C. Moore.	New York, N. Y.				
New York & Harlem.	Chas. M. Russell.	W. W. McKim.	New York, N. Y.				
New York & New England.	Chas. M. Russell.	W. W. McKim.	Boston, Mass.				
Eastern Division.	O. M. Shepard.		Norwich, Conn.				
Norwich Division.	P. S. M. Andrews.		Providence, R. I.				
Providence Division.	J. T. McManis.		Middletown, N. Y.				
New York Ontario & Western.	N. B. Hankin.	Charles Clark.	Norwich, N. Y.				
Northern Division.	C. W. Lanpher.		Middletown, N. Y.				
Southern Division.	A. H. Smith.		Cleveland, O.				
New York Penn. & Ohio.	P. D. Cooper.	J. H. Holway.	Gallou, O.				
First & Second Divisions.	T. A. Phillips.		Cleveland, O.				
Third and Fourth Divisions.	J. M. Ferris.		St. Paul, Minn.				
Mahoning Division.	J. M. Ferris.		St. Paul, Minn.				
New York Providence & Boston.	H. E. Sargent.	Giles F. Ward.	St. Paul, Minn.				
Northern Pacific.	H. A. Towne.	E. T. Williams.	St. Paul, Minn.				
Pacific & P. Oreille Div.	J. W. Sprague.	J. W. Sprague.	St. Paul, Minn.				
Missouri Division.	D. H. Taylor.		St. Paul, Minn.				
Northern of Canada.	F. W. Cumberland.		Toronto, Can.				
North Carolina.	See Piedmont Air-Line.		Philadelphia, Pa.				
Northern Central.	Frank Thompson.		Baltimore, Md.				
Northern Central.	G. C. Wilkins.	A. W. Sumner.	Baltimore, Md.				
Baltimore Division.	R. Nelson.		Washington, D. C.				
Elmira & Canadaigua Div.	W. A. Baldwin.		Washington, D. C.				
Susquehanna Division.	W. A. Baldwin.		Washington, D. C.				
Northern New Hampshire.	George E. Todd.		Athens, Ga.				
Northeastern (Georgia).	Lyman Wells.		Charleston, S. C.				
Northeastern South Carolina.	J. F. Devaux.		San Francisco, Cal.				
North Pacific Coast.	W. O. Fillmore.	W. F. Russell.	Toledo, O.				
Northwestern Ohio.	J. S. Morris.		Toronto, Can.				
Northern & Northwestern.	John W. Stewart.		Malone, N. Y.				
Ogdensburg & Lake Champlain.	A. Klops.	F. W. Stewart.	Columbus, O.				
Ohio Central.	G. G. Hadley.		Toledo, O.				
Ohio & Mississippi.	W. W. Peabody.	G. E. Atwood.	Cincinnati, O.				
Eastern Division.	C. B. Cole.		Seymour, Ind.				
Western Division.	C. B. Cole.		Louisville, Ky.				
Louisville Division.	C. B. Cole.		Boston, Mass.				
Old Colony.	J. B. Kendrick.		Fitchburg, Mass.				
Northern Division.	J. S. A. Webber.		Yonkers, N. Y.				
Cape Cod Division.	G. H. Nye.		Boston, Mass.				
Main Line Division.	J. H. French.		Oleon, N. Y.				
Olean Bradford & Warren.	J. W. Watson.	J. H. Poole.	Omaha, Neb.				
Olean & Republican Valley.	P. J. Nichols.		Omaha, Neb.				
Omaha & Northern Nebraska.	J. E. House.		Portland, Oregon.				
Oregon & California.	J. Brandt, Jr.		Owensboro, Ky.				
Oregon Railway & Navigation Co.	J. E. Culverhouse.						
Owensboro & Nashville.							
Paducah & Elizabethtown.	Robert Meek.		Elizabethtown, Ky.				
Painesville & Youngstown.	W. J. A. Newcome.		Youngstown, O.				
Parker & Kams City.	C. W. Moberly.		Parker City, Mo.				
Peach Bottom.	S. M. Stanfield.		York, Pa.				
Paw Paw & Toledo & South Haven.	John Ihing.		Lawton, Mich.				
Pennsylvania.	Frank Thompson.	Enoch Lewis.	Philadelphia, Pa.				
Pennsylvania.	Charles E. Pugh.		Altoona, Pa.				
Pennsylvania.	John Kelly.		Altoona, Pa.				
New York Division.	James McVea.		Jersey City, N. J.				
Amboy Division.	I. S. Bucklew.		Camden, N. J.				
Bolivia Division.	J. Anderson.		Lambertville, N. J.				
New Jersey Division.	F. Wolcott Jackson.		Jersey City, N. J.				
Philadelphia Division.	W. F. Lockard.		Philadelphia, Pa.				
Middle Division.	S. M. Prevost.		Harrisburg, Pa.				
Pittsburg Division.	Robert Pitcairn.		Pittsburg, Pa.				
Tyone Division.	S. S. Blair.		Tyone, Pa.				
Bedford Division.	Thos. A. Roberts.		Harrisburg, Pa.				
West Pennsylvania Division.	E. B. Taylor.		Allegheny City, Pa.				
Lewistown Division.	J. P. Hutchinson.		Lewistown, Pa.				
Pensacola & Selma.	W. D. Chipley.		Pensacola, Fla.				
Peoria, Decatur & Evansville.	J. R. Cobleigh.	G. R. Cobleigh.	Peoria, Ill.				
Peoria & Jacksonville.	G. Geo. Skinner.	Geo. Skinner.	Peoria, Ill.				
Peoria & Springfield.	J. R. Hillard.	J. R. Hillard.	Peoria, Ill.				
Petersburg.	R. Sully.	L. E. Clark.	Petersburg, Va.				
Philadelphia & Atlantic City.	Ellis Clark.	Ellis Clark.	Philadelphia, Pa.				
Philadelphia & Reading.	J. E. Wooten.	W. S. Wilson.	Philadelphia, Pa.				
Catawissa & Williamsport Br. O. Reinhardt.	Alex. M. Wilson.		Williamsport, Pa.				
Reading & Columbia.	H. W. Tracy.		Columbia, Pa.				
Lebanon & Tremont.	E. A. Sweigard.		Philadelphia, Pa.				
N. Penn. & Brook Div'n's.	H. W. Wood.	Henry Wood.	Philadelphia, Pa.				
Philadelphia & Delaware Central.	Wm. A. Baldwin.		Williamsport, Pa.				
Philadelphia & Erie.	J. W. Reynolds.	Enoch Lewis.	Philadelphia, Pa.				
Western Division.	E. B. Westfall.		Renovo, Pa.				
Middle Division.	Thos. Guckey.		Sunbury, Pa.				
Danv. Haz. & W. Barre Div.	Joseph Crawford.		Philadelphia, Pa.				
Philadelphia, Wilmington & Balt. Div.	J. F. Kenney.		Philadelphia, Pa.				
Philadelphia, Newt'n & New York L. L. Bush.	W. K. Talcott.	R. H. Duesberry.	Richmond, Va.				
Piedmont Air-Line.	W. A. Green.		Richmond, Va.				
Richmond & Danville Div.	A. B. Andrews.		Raleigh, N. C.				
North Carolina Division.							

MARCH, 1881.

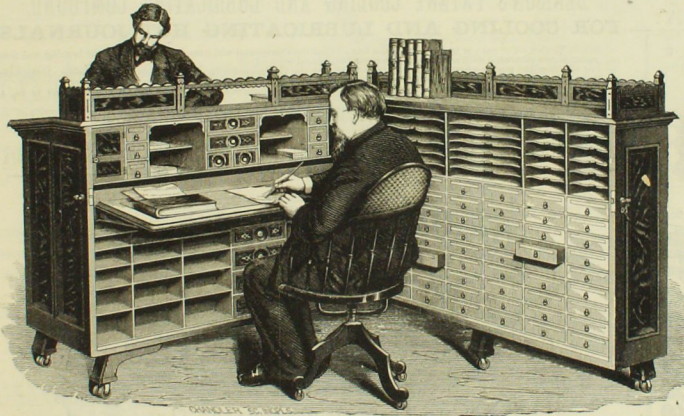
MARCH, 1881.]

THE NATIONAL CAR-BUILDER.

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Railroad.	Superintendent.	Purchasing Agent.	Residence.	Railroad.	Superintendent.	Purchasing Agent.	Residence.
Terre Haute & Southeastern	George Albertson		Terre Haute, Ind.	Eastern Division	R. Andrews		Toledo, O.
Texas & New Orleans	C. A. Hurton	P. B. Watson	Houston, Tex.	Western Division	Thos. McKissock		St. Louis, Mo.
Texas & Pacific	Geo. Noble	C. O. Cominsky	Marshall, Tex.	Illinois Division	H. F. Clark		Springfield, Ill.
Jefferson Division	C. Harris		Marshall, Tex.	Ohio & Indiana Division	K. H. Wade		Fort Wayne, Ind.
Texas Western	J. W. Goodwin		Houston, Tex.	St. L., K. C. & N.	G. B. Tardiff		Moberly, Mo.
Texas & St. Louis	C. F. Stephens		Tyler, Tex.	Council Bluffs & Omaha Div.	J. W. Blanchard		St. Louis, Mo.
Tioga	L. H. Shattuck		Blossburg, Pa.	Iowa & Iowa Division	F. Merrill		Des Moines, Ia.
Toledo, Delphos & Burlington	J. O. Arnold	H. A. Eaton	Delphos, O.	Kansas City Division	M. G. Cary		Kansas City, Mo.
Toledo & Ann Arbor	H. W. Ashley		Ann Arbor, Mich.	Quincy, Mo. & Pacific Div.	F. D. Schermerhorn		Quincy, Ill.
Troy & Boston	E. E. Aldrich	D. Robinson	Troy, N. Y.	Chicago Division	A. H. Wood		Chicago, Ill.
Toronto, Grey & Bruce	Edmund Wrage	W. Watson	Toronto, Can.	Walsh, Chester & Western	J. H. Jones		Walsh, N. Y.
Toronto & Nipissing	John Duncan	John Symons	Toronto, Can.	Washington & Ohio	R. H. Havener	R. H. Havener	Alexandria, Va.
Tuckerton	J. J. Pharo		Tuckerton, N. J.	Waynesburg & Washington	F. O. Wyatt		Waynesburg, Pa.
Union Pacific	Geo. Covkendall		Randout, N. Y.	Wells	William Pay		St. Catherine, Ont.
Union Pacific	S. H. B. Clarke	A. D. Clark	Omaha, Neb.	Westchester & Philadelphia	Henry Wood		Philadelphia, Pa.
Union Pacific	J. H. Nichols		Omaha, Neb.	West Feliciana	J. B. McChesney		Laurel Hill, La.
Western Division	W. B. Daddridge		Evansville, Ind.	West Jersey	Joe Crawford		Camden, N. J.
Mountain Division	Robert Law		Cheyenne, W. T.	Western of Alabama	Cecil Gabbett	Cecil Gabbett	Montgomery, Ala.
Laramie Division	Edw. Dickinson		Laramie, W. T.	Western of North Carolina	L. C. Jones		Fayetteville, N. C.
Colorado Division	A. A. Egbert		Denver, Col.	Western Maryland	J. M. Hood	J. M. Hood	Baltimore, Md.
Kansas Division	S. T. Smith		Kansas City, Mo.	Western North Carolina	A. B. Andrews	Geo. P. Erwin	Asheville, N. C.
Denver & S. Park Division	C. W. Fisher		Denver, Col.	Whitewater	W. W. Worthington		Wayne, Ind.
Union R. R. Trans. & S. Yard Co.	M. A. Downing	Albert Scott	Indianapolis, Ind.	Whitby Port Perry & Lindsay	Jas. Hoden		Whitby, Ont.
Utah Central	John Sharp	S. H. Hill	Salt Lake City	Williamstown	H. B. Pitts		Berlin, Md.
Utah Northern	Geo. W. Thatcher		Logan, Utah	Wilmington, Columbia & Augusta	J. F. Bodine		Wilmington, N. J.
Utah Western	W. W. Ritter	W. W. Ritter	Salt Lake City	Wilmington & Northern	J. F. Bodine		Wilmington, N. C.
Utica & Black River	J. F. Maynard		Utica, N. Y.	Windsor & Annapolis	P. Innes	J. F. Bodine	Kenilworth, N. S.
Utica, Ithaca & Elmira	Geo. J. Rice	L. G. Gresham	Horseheads, N. Y.	Wisconsin Central	F. N. Finney	J. W. Curtis	Milwaukee, Wis.
Valley	Samuel Briggs	Samuel Briggs	Cleveland, O.	Wisconsin Valley	C. F. Patton		Milwaukee, Wis.
Vicksburg & Brunswick	W. G. Raulo		Nacogdoches, Tex.	So. Mil. & Northern	G. Campbell		Stevens Point, Wis.
Vermont Valley	John Mulligan		Springfield, Mass.	Woodstock	J. G. Porter		Woodstock, Vt.
Vicksburg & Meridian	E. F. Haworth		Vicksburg, Miss.	Worcester & Nashua	C. S. Turner	C. S. Turner	Worcester, Mass.
Vicksburg, Shreveport & Pacific	J. W. Green	J. W. Green	Monroe, La.	Worcester & Shrewsbury	J. F. Bigelow		Worcester, Mass.
Virginia & Truckee	H. M. Yarrington	C. P. Mason	Carson, Nev.	Worcester & Somerset	F. J. Paister		Philadelphia, Pa.
Virginia Midland	Peyton Randolph		Alexandria, Va.				
Wabash, St. Louis & Pacific	John C. Gault	R. W. Green	St. Louis, Mo.				

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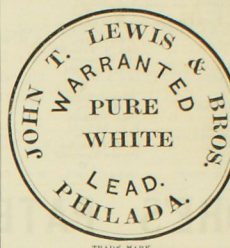
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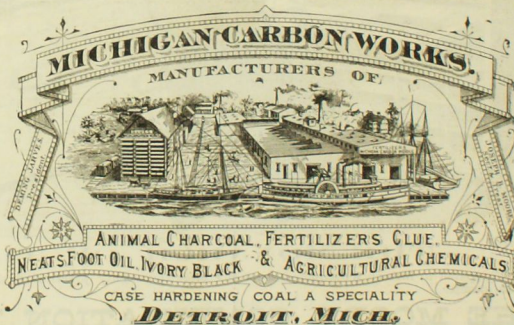
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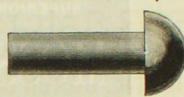
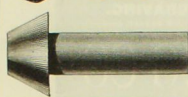
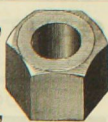
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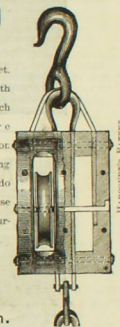
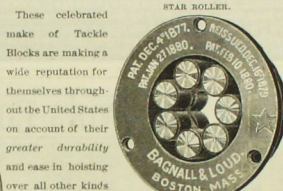
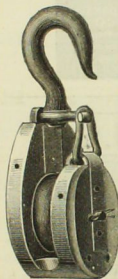
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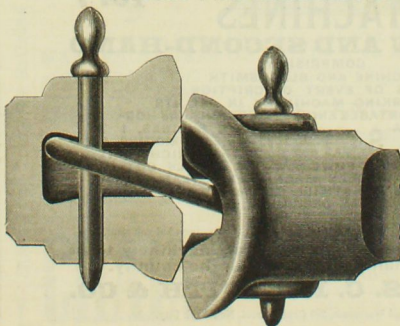
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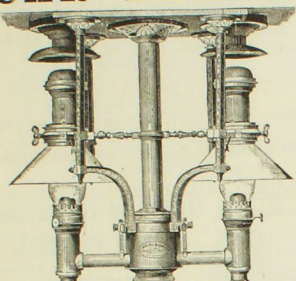
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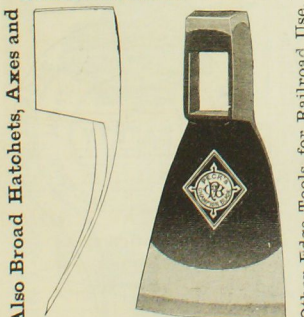
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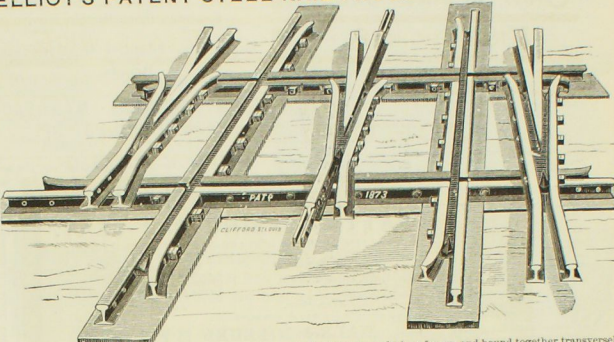


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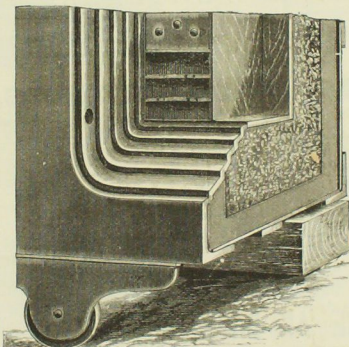
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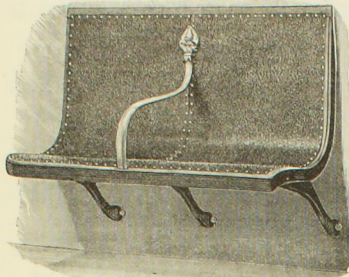
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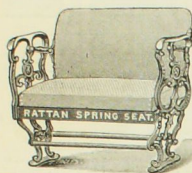
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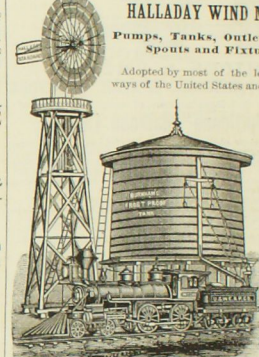
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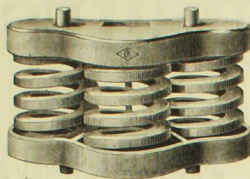
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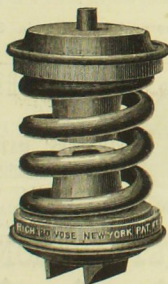
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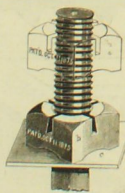
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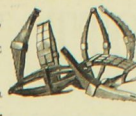
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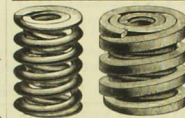
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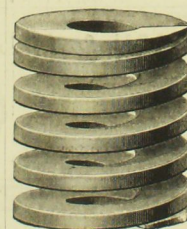
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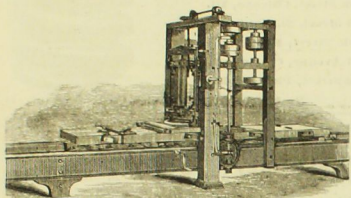
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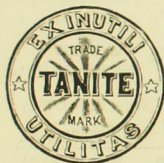
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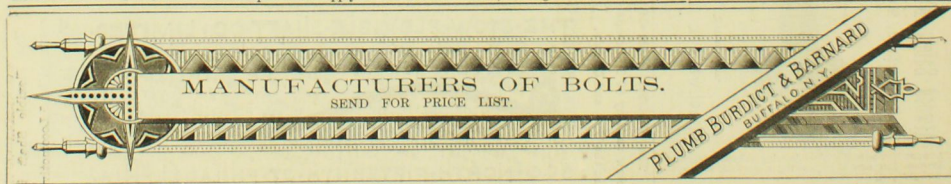
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